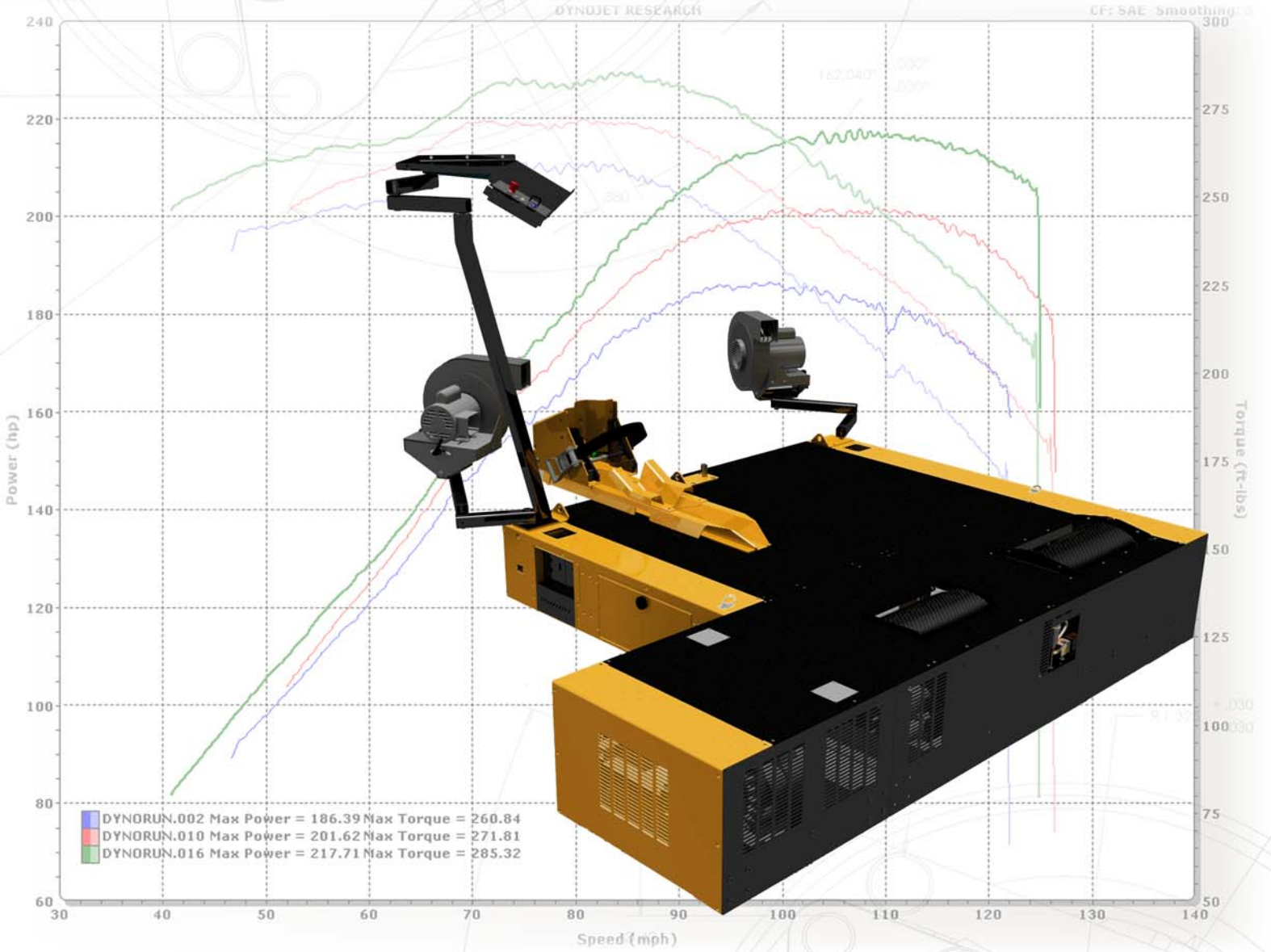
Dynojet RESEARCH


DYNOJET RESEARCH
CF: SAE Smoothing: 3
Power (hp)
Torque (ft-lbs)
Speed (mph)
DYNORUN.002 Max Power = 186.39 Max Torque = 260.84
DYNORUN.010 Max Power = 201.62 Max Torque = 271.81
DYNORUN.016 Max Power = 217.71 Max Torque = 285.32

Installation Guide

For Above Ground Model 200iX/250iX Motorcycle Dynamometers

P/N 98200026.01

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Installation Guide For Above Ground Model 200iX and 250iX Motorcycle Dynamometers.

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Part Number: 98200026 Version 1 (05/2010)

Dynamometer Number: _____

iX Dynamometer Number: _____

Eddy Current Brake
(Retarder) Number:_____

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WARNINGS

Disclaimers

Dynojet Research, Inc. (Dynojet) makes no representation or warranties with respect to the contents hereof and specifically disclaims any implied warranties of merchantability for any particular purpose.

Dynojet reserves the right to revise this publication and to make changes from time to time in the content hereof without obligation of Dynojet to notify any person of such revision or changes.

Dynojet is not responsible for false operation due to unexpected dynamometer operation such as may be caused by static, software bugs, hardware failure, etc.

Dynojet is not responsible for damage resulting from improper installation of the dynamometer or from improper service rendered to the dynamometer. Dynojet is not responsible for damage incurred due to alteration of the dynamometer or components, use of unapproved parts, or abuse to the dynamometer.

Do not connect or disconnect cables or components on the dynamometer with the power on.

Always wear protective clothing, ear protection, and eye protection (goggles, safety glasses) when using and servicing the dynamometer.

CAUTION

Equipment Power Requirements

The dynamometer has specific power requirements. Connecting the dynamometer to the incorrect voltage will void the dynamometer warranty. Installation may require a licensed electrician.

WARNING

Potentially Lethal Voltages

Components attached to and within the dynamometer operate with potentially lethal voltages. To provide the greatest assurance of safety, the AC power cord(s) must be disconnected from the power source before servicing electrical components or wiring. Disconnect all power cords before servicing electrical components for the greatest assurance of safety.

WARNING

Electrostatic Discharge Precautions

Electrostatic Discharge

Electrostatic Discharge (ESD), or static shock, can damage electronic components within the dynamometer. The damage may occur at the time of an ESD occurrence, or the shock may degrade the component, resulting in a premature component failure later. To avoid ESD damage, always practice good ESD control precautions when servicing the dynamometer. Dynojet designs its dynamometers to be very tolerant of static shocks by the users, but the electronics are vulnerable when the electronics are exposed. ESD occurs as a result of a difference of potential between two objects when the two objects touch. Damage occurs as a result of the energy released when the discharge (touch) occurs. The difference of potential can accumulate by as simple an action as a user moving across carpet or a seat. If that person's energy is discharged directly to the electronics, the electronics can be damaged.

Precautions

To protect against ESD damage, you must eliminate the difference of potential before the electronics are handled. Touch the chassis of the dynamometer before touching any of the electronics. By touching the chassis, you discharge any static shocks to the chassis instead of to the electronics.

If you are holding a circuit board or dynamometer component in your hand when you approach the machine, touch the chassis of the dynamometer with your hand before installing the circuit board or component.

When handing a circuit board or component to someone, touch that person with your hand first, then hand them the component.

Always carry circuit boards in anti-static bags when the boards are exposed (removed from the dynamometer).

CAUTION

Battery Fire and Explosion Hazards

There is a danger of explosion if the battery is incorrectly replaced. Replace only with the same or equivalent type recommended by the manufacturer. Discard used batteries according to the manufacturer's instructions.

Automotive Batteries

In operation, batteries generate and release flammable hydrogen gas. They must always be assumed to contain this gas which, if ignited by burning cigarette, naked flame or spark, may cause battery explosion with dispersion of casing fragments and corrosive liquid electrolyte. Carefully follow manufacturer's instructions for installation and service. Keep away all sources of gas ignition and do not allow metallic articles to simultaneously contact the negative and positive terminals of a battery.

Do not allow the positive and negative terminals to short-circuit. The dynamometer chassis is tied to the negative side of the battery. Do not short between the positive battery terminal or the starter connections to the chassis. In addition, make sure metal tools such as screw drivers, wrenches, and torque wrenches do not come in contact with the negative and positive terminals of the battery. Short circuiting the terminals of the battery can cause burn injuries, damage to the dynamometer, or trigger explosions.

Charging

Batteries being charged will generate and release flammable hydrogen gas. Charging space should be ventilated. Keep battery vent caps in position. Prohibit smoking and avoid creation of flames and sparks nearby.

Wear protective clothing, eye and face protection, when charging or handling batteries.

Other Potential Hazards

The AC power outlet shall be installed near the equipment and it shall be easily accessible to allow for disconnect before service.

The dynamometer should be located in a well ventilated area. There is a carbon monoxide hazard with all internal combustion engines. Engine exhaust contains poisonous carbon monoxide gas. Breathing it could cause death.

Any dyno room design must incorporate sufficient exhaust extraction.

Always wear proper ear and eye protection when operating the dynamometer.

Never operate the dynamometer with the covers removed.

Never stand behind the dynamometer when in operation.

Never operate the dynamometer when there is excessive vibration or noise. Resolve these problems before proceeding.

Never fuel the vehicle on the dynamometer unless appropriate safety measures are taken.

Verify brake operation before beginning any dynamometer testing.

Verify the vehicle is properly secured to the dynamometer.

Never operate the blowers without the guards installed.

Exercise care with any dynamometer testing; portions of the dynamometer and vehicle may become hot.

As with any equipment using electricity and having moving parts, there are potential hazards. To use this dynamometer safely, the operator should become familiar with the instructions for operation of the dynamometer and always exercise care when using it.

Do not repair or replace any part of the dynamometer or attempt any servicing unless specifically recommended in published user-repair instructions that you understand and have the skills to carry out.

CHAPTER

1

SPECIFICATIONS AND OPERATING REQUIREMENTS

Thank you for purchasing Dynojet's Above Ground Model 200iX/250iX Motorcycle Dynamometer. Dynojet's software and dynamometers will give you the power to get the maximum performance out of vehicles you evaluate. Whether you are new to the benefits of a chassis dynamometer or an experienced performance leader, the repeatability and diagnostic tools of WinPEP 7 software and a Dynojet dynamometer will give you the professional results you are looking for.

This document provides instructions for installing the above ground motorcycle dynamometer (dyno) along with the kart upgrade. This document will walk you through operating requirements, installation, accessories, and basic dyno operation. To ensure safety and accuracy in the procedures, perform the procedures as they are described.

Document Part Number: 98200026

Version 1

Last Updated: 05-05-2010

This chapter is divided into the following categories:

- Introduction, page 1-2
- Dynamometer Specifications and Requirements, page 1-5
- Dyno Electronics, page 1-10

INTRODUCTION

Before installing your dyno, please take a moment to read this guide for installation instructions, dyno features, and other important information.

This guide is designed to be a reference tool in your everyday work and includes the following chapters and information:

Specifications and Operating Requirements

This chapter describes the requirements and specifications for the dyno.

Installation

This chapter describes the procedures for installing the dyno.

Accessories

This chapter lists each dyno accessory alphabetically and describes the procedures for installing and using the accessory.

Control Panel Interface Operation

This chapter describes the Control Panel Interface (CPI) operating procedures.

Basic Dyno Operation

This chapter describes basic dyno operating procedures.

Red Head Installation

This appendix describes the procedures for installing the Red Head anchors.

Power Requirements

This appendix describes the power requirements and installation instructions for all locations excluding North America.

EEC Finger Guard & Door Safety Switch Kit

This appendix describes the procedures for installing the EEC finger guards and door safety switch.

Theta Controller

This appendix describes how to make power adjustments to the theta controller.

CONVENTIONS USED IN THIS MANUAL

The conventions used in this manual are designed to protect both the user and the equipment.

example of convention	description
	The Caution icon indicates a potential hazard to the dynamometer equipment. Follow all procedures exactly as they are described and use care when performing all procedures.
	The Warning icon indicates potential harm to the person performing a procedure and/or the dynamometer equipment.
	The Record # icon reminds you to record your dynamometer and/or eddy current brake (retarder) number on the inside cover of this manual.
Bold	Highlights items you can select on in the software interface, including buttons and menus.
➤	The arrow indicates a menu choice. For example, "select **File ➤Open**" means "select the **File** menu, then select the **Open** choice on the **File** menu."

TECHNICAL SUPPORT

For assistance, please contact Dynojet Technical Support at 1-800-992-3525, or write to Dynojet at 2191 Mendenhall Drive, North Las Vegas, NV 89081.

Visit us on the World Wide Web at www.dynojet.com and www.winpep.com where Dynojet provides state of the art technical support, on-line shopping, 3D visualizations, and press releases about our latest product lines.

YOUR DYNO ROOM

This section is not meant to imply that a dyno room is essential to repeatable results on a Dynojet dynamometer. However, a dyno room with an engine cooling intake fan, exhaust extraction, and noise reduction capabilities can add a new dimension to your shop.

A proper dyno room design will help to ensure repeatable, accurate runs. A good dyno room should do the following:

- minimize noise
- provide a controlled environment for testing
- provide a view window (safety glass) for customers
- be designed with safety in mind

Intake Air Fan—After building your dyno room, you will need to supply an intake air fan. The intake air fan supplies air to cool the bike's engine while supplying fresh oxygen for you and your bike to breathe. It is a common misconception that you cannot tune a bike without a large fan simulating exact road conditions; however, a good cooling fan is the only requirement for consistent diagnostics and tuning. The installed fan should be 5200 CFM.

Equalizer Box—If the air flow rate coming into the dyno room is greater than the air flow rate leaving the dyno room, the room will become pressurized. A pressurized dyno room will make measured power misleading. To compensate, you need an equalizer box. The equalizer box is a baffled (to reduce noise) vent to the outside of your dyno room. The size of the equalizer box is dependent on the size of your dyno room and the size of your fans.

Exhaust Extraction—An exhaust fan is needed to remove exhaust gasses, especially carbon monoxide, from the dyno room. Carbon monoxide is potentially lethal to people if not removed from the room and will affect engine power when mixed with fresh air. Plans for exhaust extraction (P/N 73429201) are available from Dynojet.

WARNING

Engine exhaust contains poisonous carbon monoxide gas. Breathing it could cause death. Operate machine in well ventilated area.

Fire Suppression—Always have adequate fire suppression or fire extinguishers in your dyno room.

Industrial Noise Control, Inc.—Industrial Noise Control, Inc. offers a zinc-coated steel room custom built to your specifications. This room meets all dyno room requirements. The dyno room must be clean and dry with a comfortable room air temperature above 32 degrees Fahrenheit (0 degrees Celsius), and have some system of exhaust extraction. For more information on a dyno room, refer to your Pre-Installation Guide For Model 200i, 250i, 200iP, and 250iP Motorcycle Dynamometers (P/N 98129103).

DYNAMOMETER SPECIFICATIONS AND REQUIREMENTS

The following specifications and requirements will help you set up your dyno area and verify you have the requirements to operate your dyno safely.

BATTERY REQUIREMENTS

Your 200iX/250iX dyno is designed to carry a group 24 deep-cycle discharge series battery for operating the starter, power carriage, and optional wheel clamp. The typical dimensions for this series of batteries are 27 cm long by 17 cm wide by 23 cm tall (10.625-inches by 6.75-inches by 9.125-inches). The mounting is flexible so a battery that has dimensions close to this will work satisfactorily. The built-in battery cables are configured for top-post batteries. This battery is not included with your dyno. You will need to provide this battery. For more information on installing the battery, refer to "Installing the Battery" on page 2-36.

CHASSIS SPECIFICATIONS

description	specifications
Length	
with standard carriage	allow 271.78 cm (107.00 in.)
with extended carriage	allow 322.58 cm (127.00 in.)
with ramp	370.84 cm (146.00 in.)
Height	
to top of dyno cover	45.97 cm (18.00 in.)
Width	
model 200iX	200.69 cm (79.00 in.)
model 250iX	274.32 cm (108.00 in.)
Weight	
model 200i dyno/crated dyno	725 kg (1600 pounds)/771 kg (1700 pounds)
model 250i retarder module/crated	953 kg (2100 pounds)/1,089 kg (2400 pounds)
200iX/250iX drum module/crated	136 kg (300 pounds)/363 kg (800 pounds)
Drum	
diameter	45.72 cm (18.00 in.)
width	50.80 cm (20.00 in.)
diameter, 200iX/250iX	45.72 cm (18.00 in.)
width, 200iX/250iX	55.88 cm (22.00 in.)
Frame	structural steel
Maximum Speed	322 KPH (200 MPH)
Maximum Motorcycle Length (front of front wheel to center of rear wheel)	
standard carriage	213.00 cm (84.00 in.)
extended carriage	256.54 cm (101.00 in.)
Remote Switches	remote software control

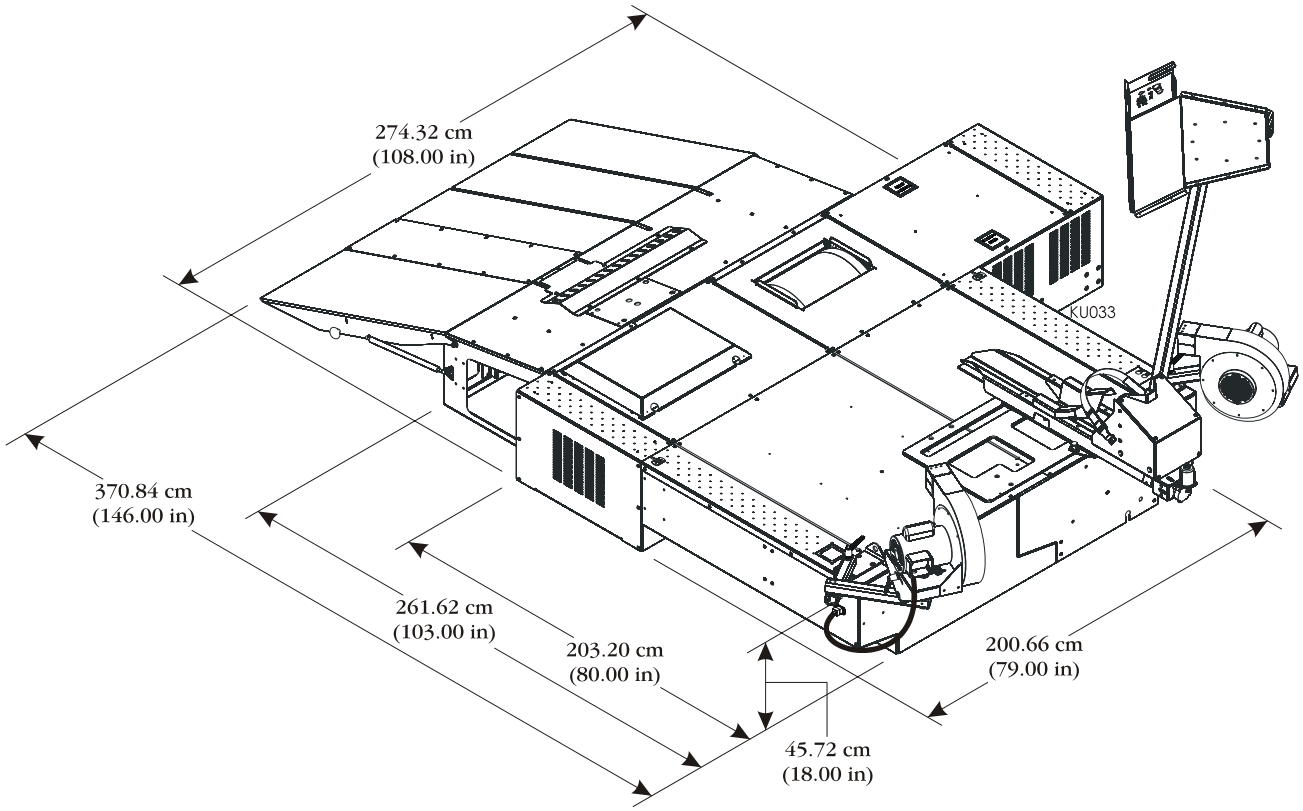


Figure 1-1: Model 250iX Dyno Dimensions

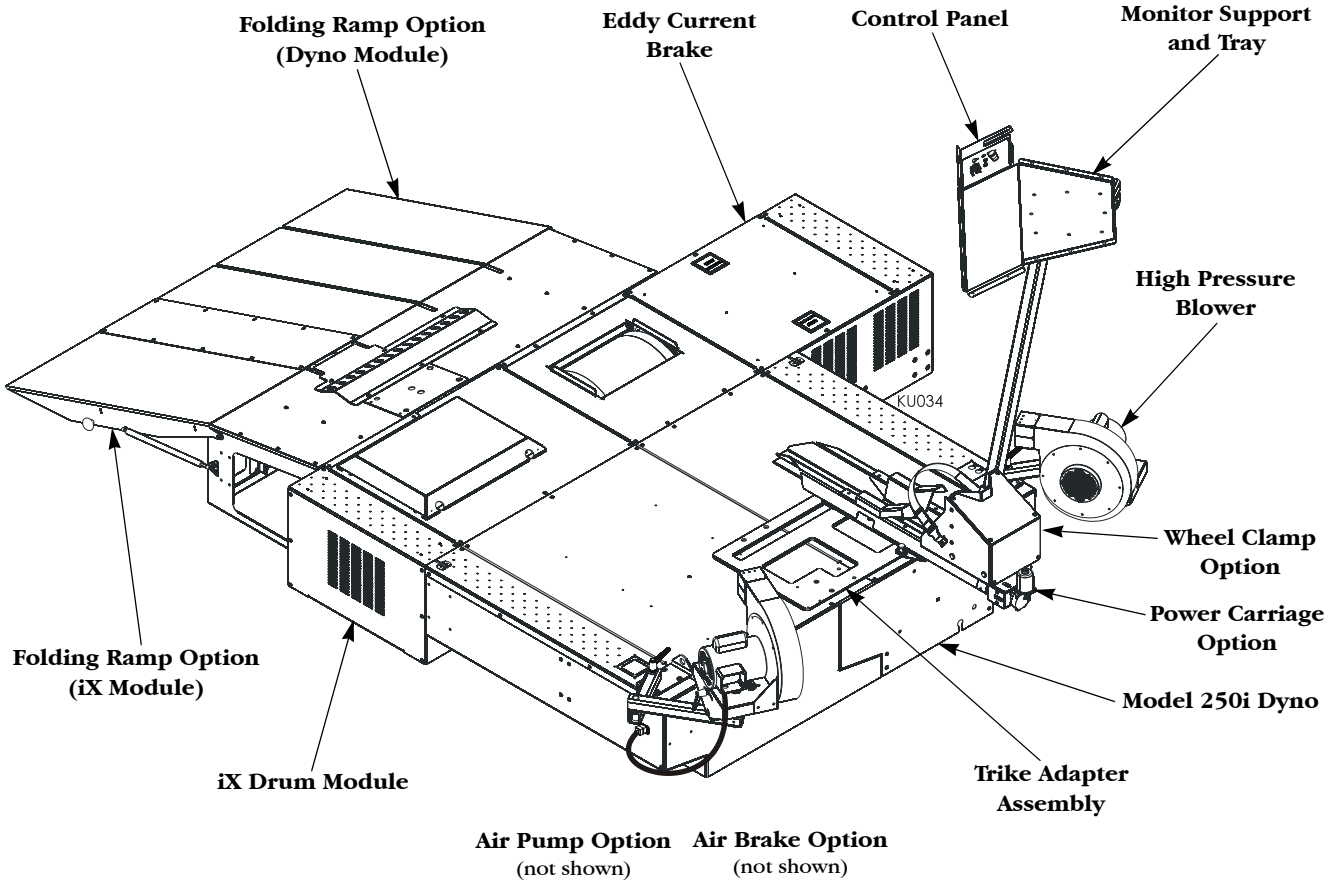


Figure 1-2: Model 250iX Dyno with Accessories

Compressed Air Requirements

The following requirements are needed when the optional air brake is included:

- regulator set to 65 psi max (450 kilopascal)
- air dryer
- shut off valve
- gauge on the regulator
- 1/4-inch NPT pipe thread connector (to attach air to the dyno)

The following requirements are needed for the on-board compressed air pump assembly:

- Clean and dry air, 100 psi or greater, 5 CFM or better flow
- Fittings to hook your air system to a 3/8-inch inside diameter hose (if no air brake is present)
- optional air regulator

Computer Specifications

You will need to provide a computer system to run the WinPEP software. WinPEP 7 includes complete documentation in online Help. From the WinPEP 7 menu bar, choose **Help ►WinPEP 7 Help** or visit www.winpep.com (accessible with a valid user name and password). Refer to the section on Computer Specifications in the WinPEP documentation, P/N 98118103, for the specific computer system requirements.

Drill and Drill Bit Requirements

You will need to provide a drill and drill bit capable of drilling holes in concrete. Refer to Appendix A for more information on installing Red Head Anchors.

- drill bit size: 1/2-inch
- minimum hole depth: 1 5/8-inch (41.2 mm)

Electrical Requirements

The Model 200iX/250iX dynamometers require a 240V - 30a single-phase electrical circuit for reliable and precise operation. No other loads should be plugged into these circuits and these circuits should be independent of the lighting in the dyno room. Before you plug in your dyno, you or your electrician must refer to Appendix B for detailed information.

ENVIRONMENTAL REQUIREMENTS

description	specifications
Temperature	
operating min./max	10°C/50°C (50°F/122°F)
storage min./max	0°C/60°C (32°F/140°F)
Humidity	0 to 95% non condensing

FORKLIFT REQUIREMENTS

You will need to provide equipment capable of lifting a minimum of 2268 kg. (5000 lb.) to lift the dyno off the crate and into position in your dyno room. You will also need a pair of straps capable of supporting 2268 kg. (5000 lb.) to attach to the dyno. Dynojet recommends using single loop style straps.

GROUND HOOK REQUIREMENTS

You may wish to install additional ground hooks (included with your dyno) for securing the motorcycle. The tie-down loops on the pit covers should work for most motorcycles. If you are running motorcycles that require a different tie-down location, mount the ground hooks accordingly.

Note: Tie-down straps MUST pull the motorcycle forward.

Using the ground hooks as a pattern, use the hardware included with the ground hook kit to install the Red Head anchors according to the instructions in Appendix A.

PHONE AND INTERNET ACCESS

Dynojet recommends you have a phone close to the dyno to call for assistance in an emergency. You may also wish to contact Dynojet to troubleshoot your dyno.

Internet access on your computer is desirable for contacting Dynojet and downloading new information and updates.

TIE-DOWN STRAPS

Dynojet recommends using motorcycle tie-down straps for securing the bike on the dyno. You will need to provide the tie-down straps.

DYNO ELECTRONICS

The standard dyno electronics package is comprised of four interconnected modules: Atmospheric Sensing Module, RPM Module, Dynamometer Input/Output Module, and the CPU Module. For more information refer to your WinPEP 7 User Guide (P/N 98128104).

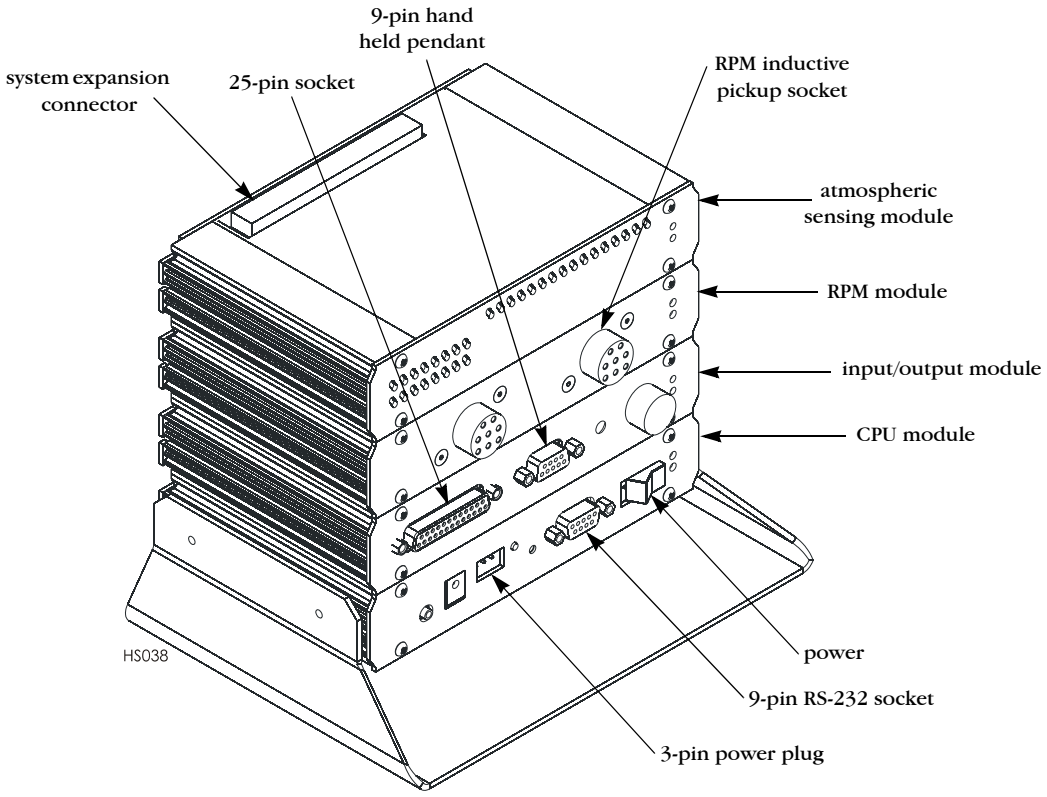


Figure 1-3: The Dyno Electronics

The standard dyno electronics is located inside the dyno electronics enclosure which is already mounted to the dyno chassis as shown in Figure 1-4. Cables which you will route later in this manual are pre-wired to the dyno electronics or to the CPI. You will connect the free ends of the cables to the appropriate devices.

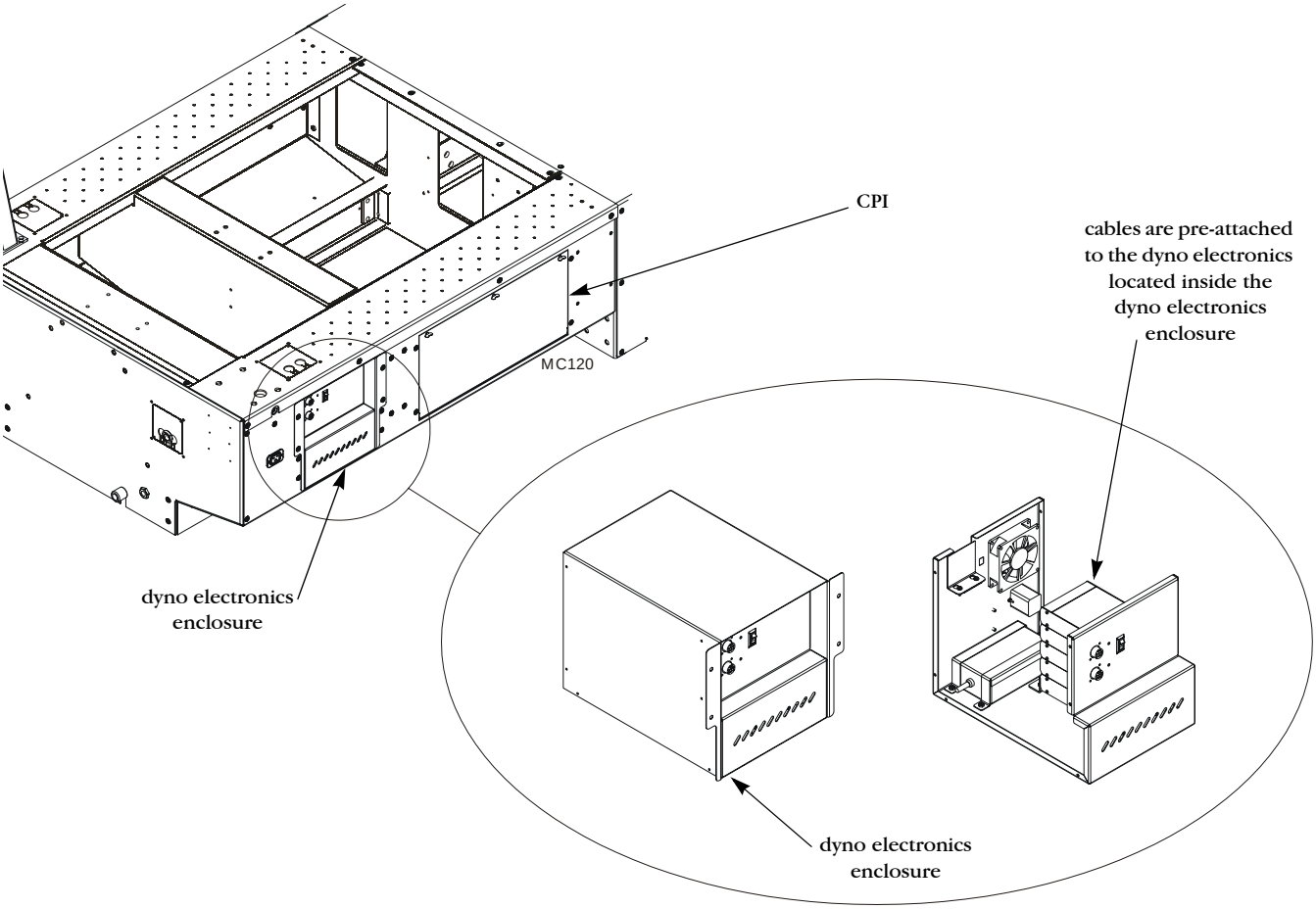

CPI
cables are pre-attached to the dyno electronics located inside the dyno electronics enclosure
MC120
dyno electronics enclosure
dyno electronics enclosure

Figure 1-4: Location of Dyno Electronics

CHAPTER

2

INSTALLATION

This chapter will walk you through unpacking and installing the dynamometer. To ensure safety and accuracy in the procedures, perform the procedures as they are described.

This chapter is divided into the following categories:

- Dyno Installation, page 2-2
- Pickup Card, page 2-12
- Compressed Air Pump Assembly, page 2-13
- Eddy Current Brake, page 2-17
- Remove Dyno Covers, page 2-25
- iX Drum Module Installation, page 2-26
- Routing Cables, page 2-34
- Side and Top Cover Installation, page 2-42
- Trike Carriage Adapter and Carriage Assembly, page 2-47
- Tie-Down Installation, page 2-51
- Monitor Support, Tray, and Control Panel, page 2-52
- High Pressure Blowers, page 2-58
- Ground Hook Installation, page 2-60
- Final Adjustments and Tests, page 2-61
- Zip Tube, page 2-63

DYNO INSTALLATION

When you receive your dyno, examine the exterior of the shipping container for any visible damage. If damage is detected at this stage, contact the shipper or Dynojet before proceeding with unpacking.

Use the following steps to unload your dyno. You will need to provide equipment capable of lifting a minimum of 2268 kg (5000 lbs.) to move the crated dyno into position in your dyno room. Refer to "Dynamometer Specifications and Requirements" on page 1-4 for more information.

The following directions describe how to unpack, and install your dyno. Follow the directions in the order that they are presented.

UNPACKING THE DYNO

1 Move the crated dyno to a clear area near your dyno room.

2 Using a pry bar, or a large flat screwdriver, and a hammer, carefully remove the top and sides of the crate.

Note: At this point, you will want to inspect the exterior of the dyno for any indications of damage. Report any damage immediately.

3 Remove the tire carriage and the monitor support. The carriage and support arm are fastened to the bottom of the crate.

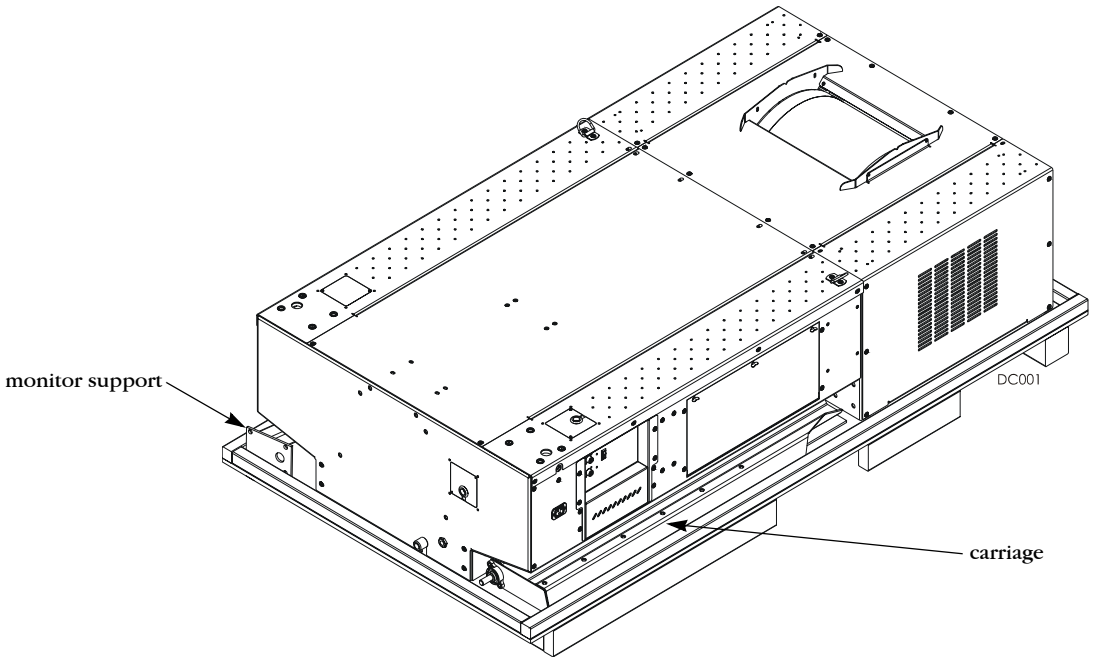


Figure 2-1: Remove the Tire Carriage and Monitor Support from the Crate

4 Remove the six 1/4-inch screws securing the center panel on the dyno and remove the center panel.

Note: Dynojet recommends using a T30 Torx driver (Snap-On PFTx30E) to remove the 1/4-inch screws. For dynos with serial numbers lower than 2030152, Dynojet recommends using a hardened 5/32-inch hex driver (such as Snap-On FA5E). A standard allen key may round off in the shallow screw head.

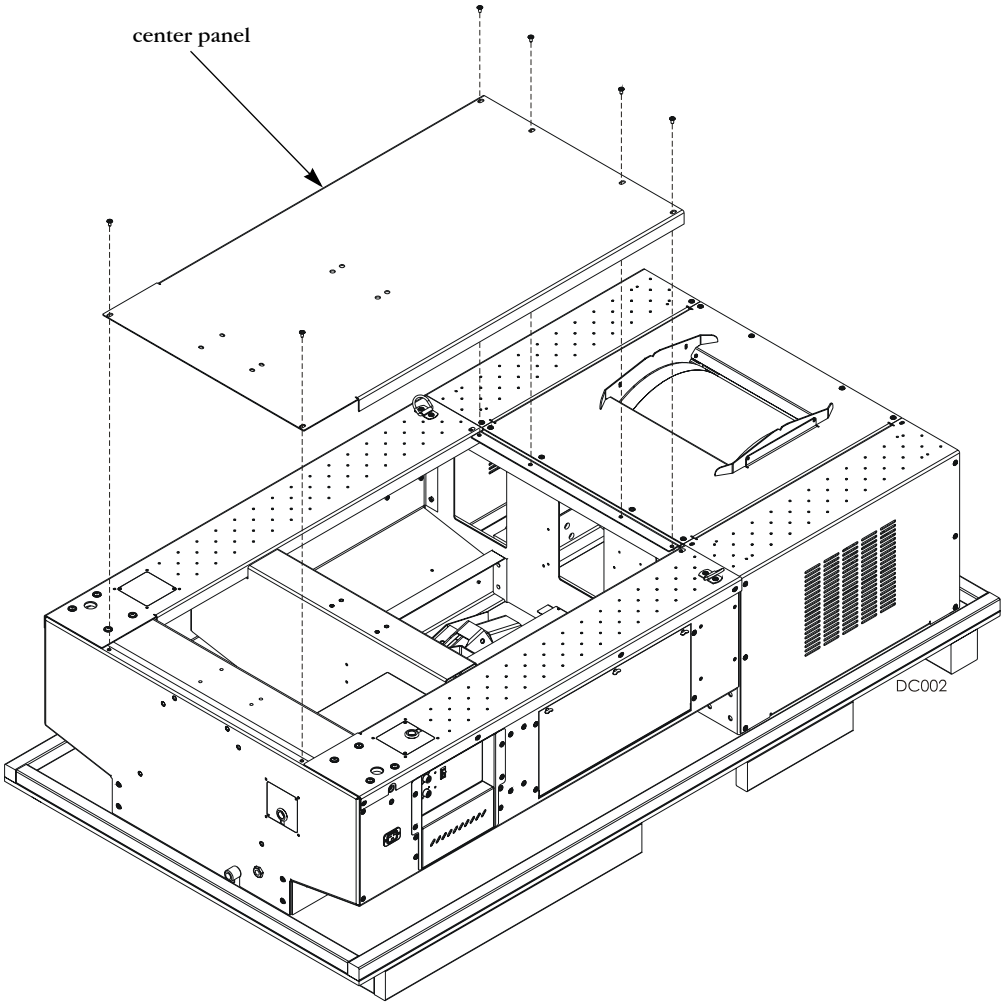


Figure 2-2: Remove the Center Panel

5 Remove the eight screws securing the top drum cover to the dyno and set aside. Remove the drum cover and set aside.

6 Remove the two top screws securing each side drum cover to the dyno and set aside.

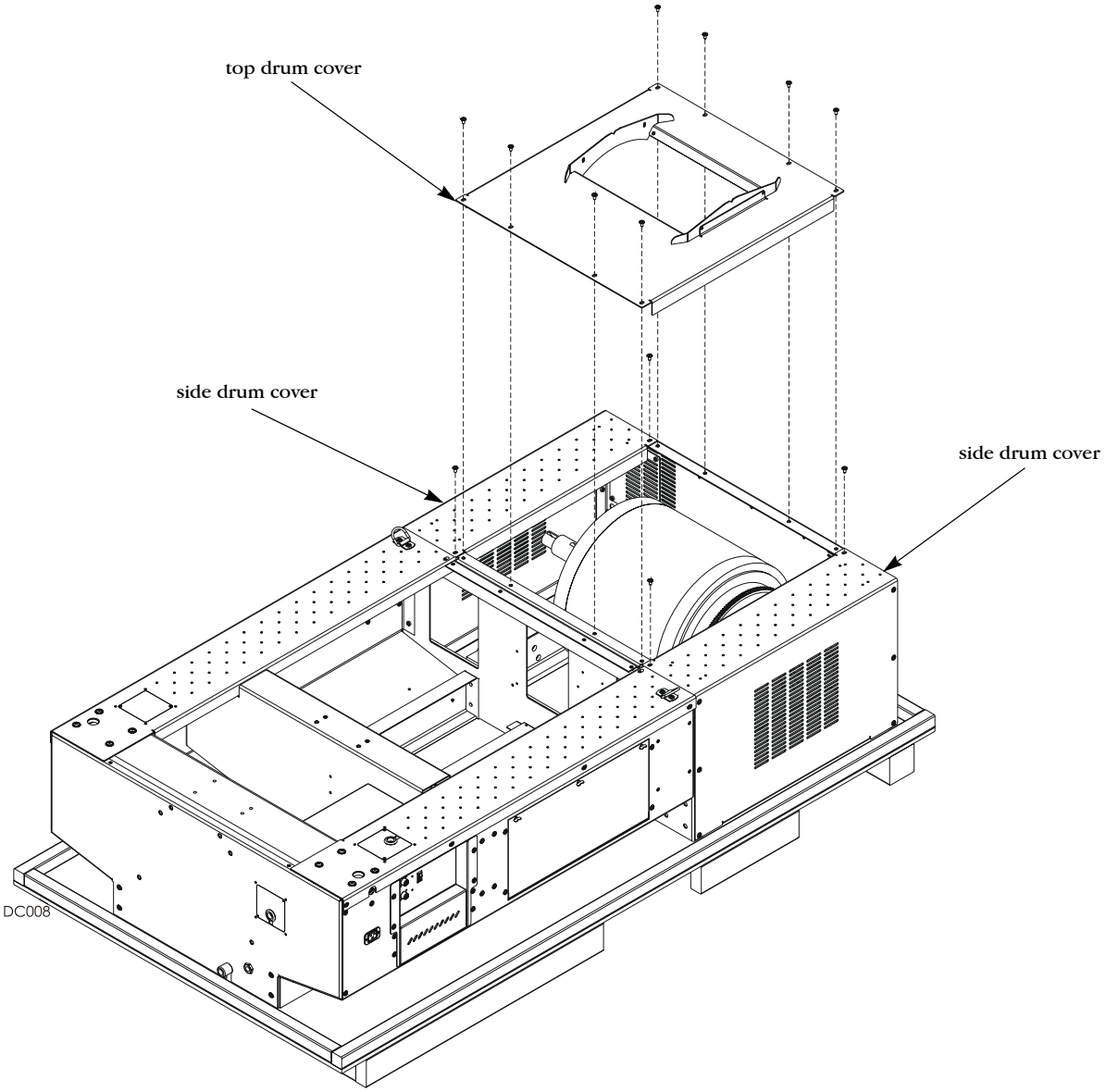


Figure 2-3: Remove the Top Drum Cover

7 Remove the remaining six side screws securing each side drum cover to the dyno and set aside. Remove the side drum covers and set aside.

Note: For future reference, note the three access holes in the drum bulkhead. These access holes will be used to route cables when installing accessories once the top cover is back on.

RECORD #

Be sure you record the dynamometer number on the inside cover of this manual.

8 Remove the tire stop, tire lock, and hardware from the middle of the dyno.

9 Verify the contents of the hardware boxes and set aside.

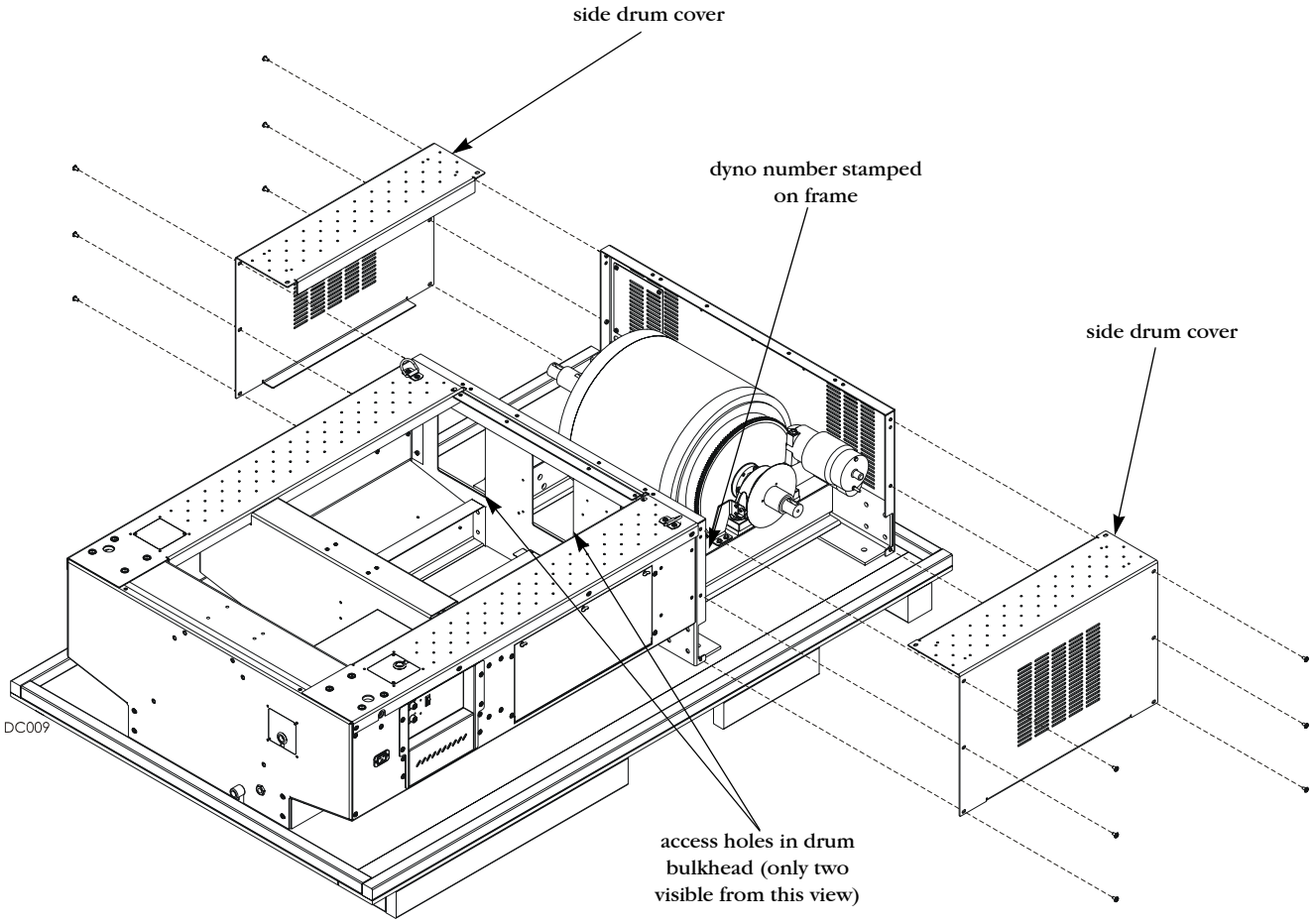
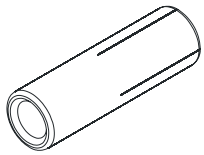
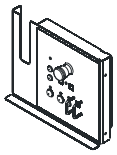
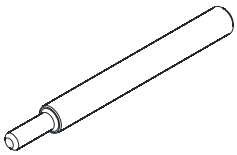
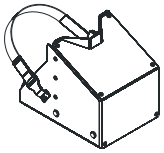
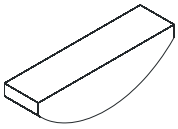
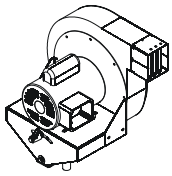
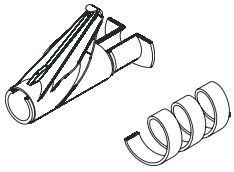
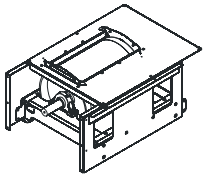
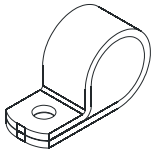
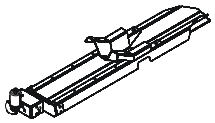
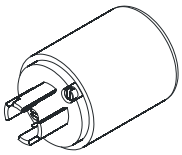
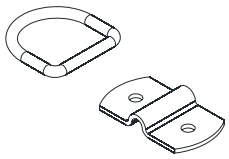
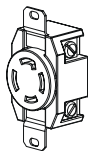
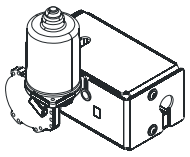
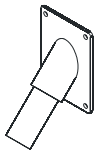
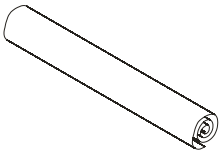
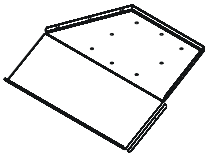
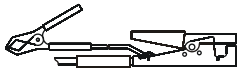
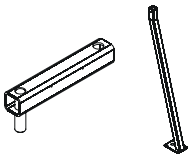
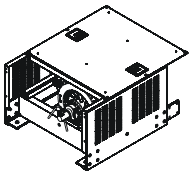
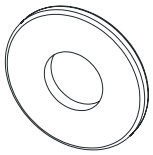
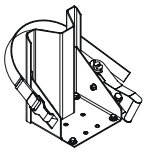
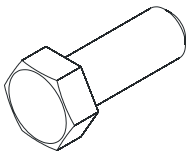
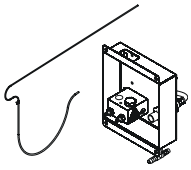
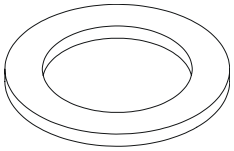
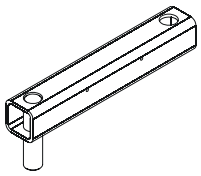
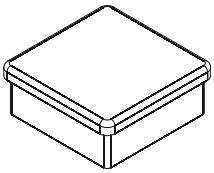
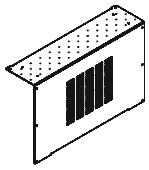
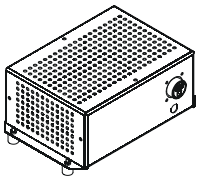
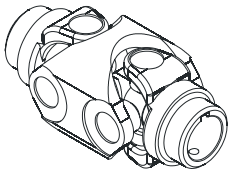
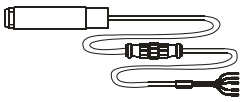
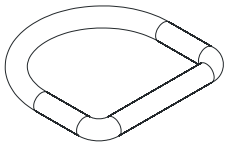
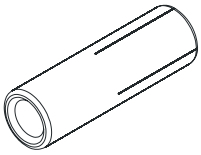
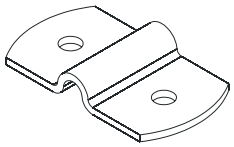
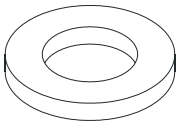
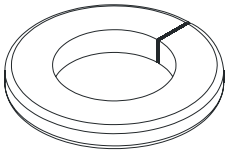
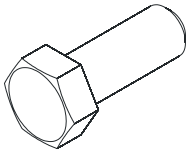

side drum cover
dyno number stamped on frame
side drum cover
DC009
access holes in drum bulkhead (only two visible from this view)

Figure 2-4: Remove the Side Drum Covers

part	description	part	description
	anchor, redhead, 3/8" (7) P/N 37513200		control panel button sub-assembly P/N 66117001
	installation tool, redhead anchor P/N 37518200		wheel clamp P/N 71329000 optional accessory
	woodruff key, 3/8 x 1-3/8" P/N 37620622		blower assembly P/N 76722005 optional accessory
	cable harness wrap kit P/N 43400000		iX upgrade kit P/N 77000003 shipped in a separate crate, refer to page 2-26
	cable clamp, 5/8" (7) P/N 43428232		standard carriage P/N 71300002 or extended carriage P/N 78100003
	plug, turnlok, 30A, 125/250V P/N 43816430		ground hook kit (2) P/N 79190001 see list of parts below
	receptacle, turnlok, 30A, 125/250V P/N 43826430		power carriage P/N 82943001 optional accessory
	control pod spindle assembly P/N 61329000		banner, dynojet (2) P/N D706

part	description	part	description
	monitor tray P/N 61329101		inductive secondary pickup (2) P/N DE100-109S
	monitor arm assembly P/N 61329003		inductive primary pickup clip P/N DE100-110L
	eddy current brake module P/N 63223700		washer, 5/16", flat (7) P/N DM150-002-007
	tire stop P/N 63310902 not included if you ordered the optional wheel clamp		bolt, 3/8-16 x 1", hex (7) P/N DM150-019-012
	on board compressed air air fuel ratio assembly P/N 64100002 optional accessory		
The following parts are included in the Monitor Arm Assembly P/N 61329003:			
	washer, 1.87 x 1.25 ID x .12 THK (3) P/N 26215520		monitor arm (2) P/N 61329100
	cap plug, 1.75 x 1/2” (4) P/N 35521420		monitor support P/N 61329500

part	description	part	description
The following parts are included in the Eddy Current Brake Assembly P/N 63223700:			
	side cover, eddy current brake P/N 21226502		theta-2 controller-240V P/N 66411003
	retarder driveline assembly P/N 62240070		temperature probe assembly P/N 76955001
The following parts are included in each Ground Hook Kit P/N 79190001:			
	ground hook/D-ring P/N 10111		anchor, redhead, 3/8" (2) P/N 37513200
	D-ring bracket, surface mount P/N 10112		washer, 5/16", flat (2) P/N DM150-002-007
	washer, 3/8", splitlock, steel (2) P/N 36932100		bolt, 3/8-16 x 1", hex (2) P/N DM150-019-012

Removing the Dyno from the Crate

You will need to provide equipment capable of lifting a minimum of 2268 kg (5000 lbs.) to lift the dyno off the crate and into position in your dyno room. You will also need a pair of straps capable of supporting 2268 kg (5000 lbs.) to attach to the dyno. Dynojet recommends using a single loop style strap.

RECORD #

Be sure you record the dynamometer number on the inside cover of this manual.

1 Remove the four lag bolts and washers securing the dyno to the crate base using a 9/16-inch socket, open or box end wrench.

2 The pickup card may be taped to the lifting eye. Remove the pickup card and set it aside.

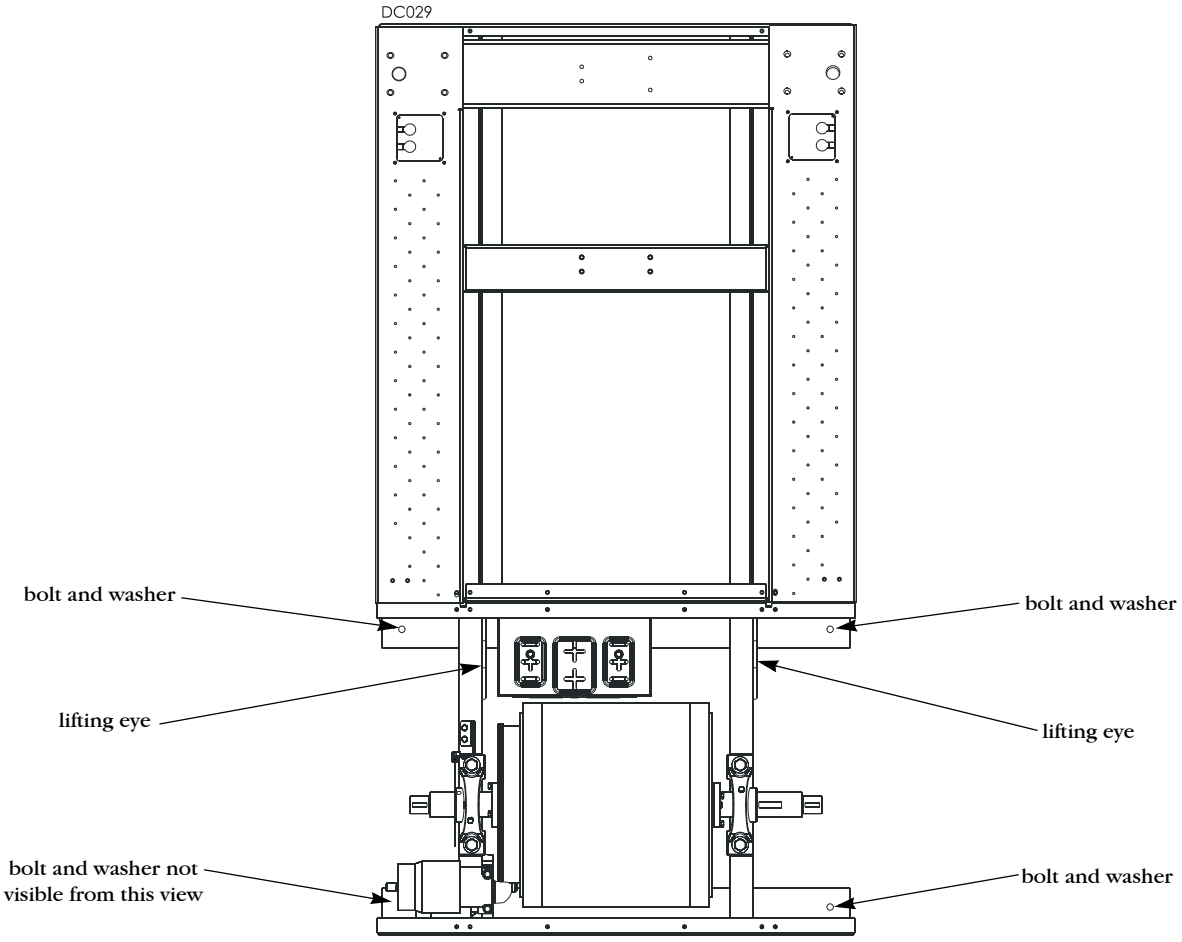


Figure 2-5: Remove the Dyno from the Crate Base

3 Route the single loop strap through the lifting eyes in front of the drum as shown in Figure 2-6.

Note: The dyno should only be lifted using the lifting eyes. Verify no other part of the dyno is interfering with the strap. Do not place the strap around the cable routing bracket or any other part of the dyno.

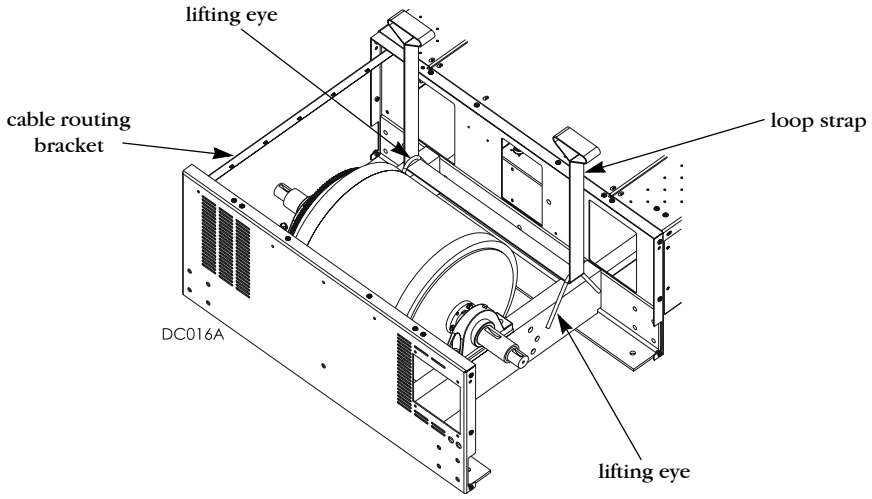


Figure 2-6: Loop Strap Placement

4 Carefully lift the dyno off the crate.

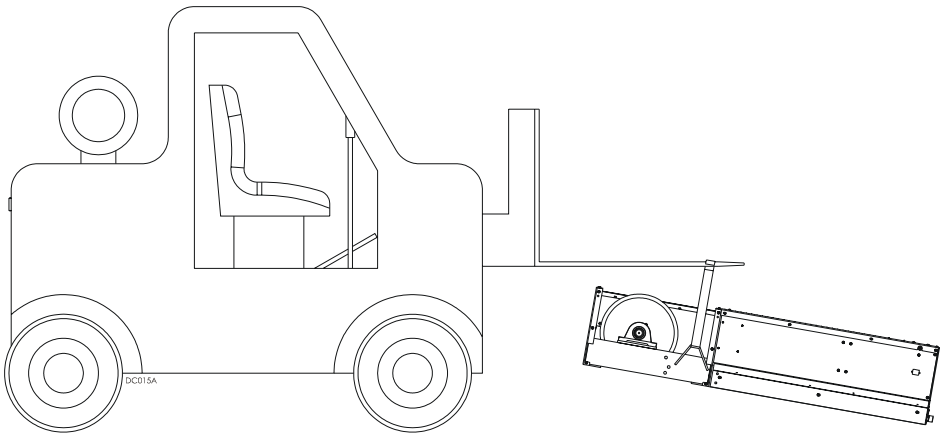


Figure 2-7: Lift the Dyno off the Crate

5 Locate the power cable inside the dyno.
6 Slide the strain relief on the power cable through the opening in the dyno frame.
7 Tighten the jam nut.
8 Hand tighten the knurled nut.
9 Move the dyno into position in your dyno room.

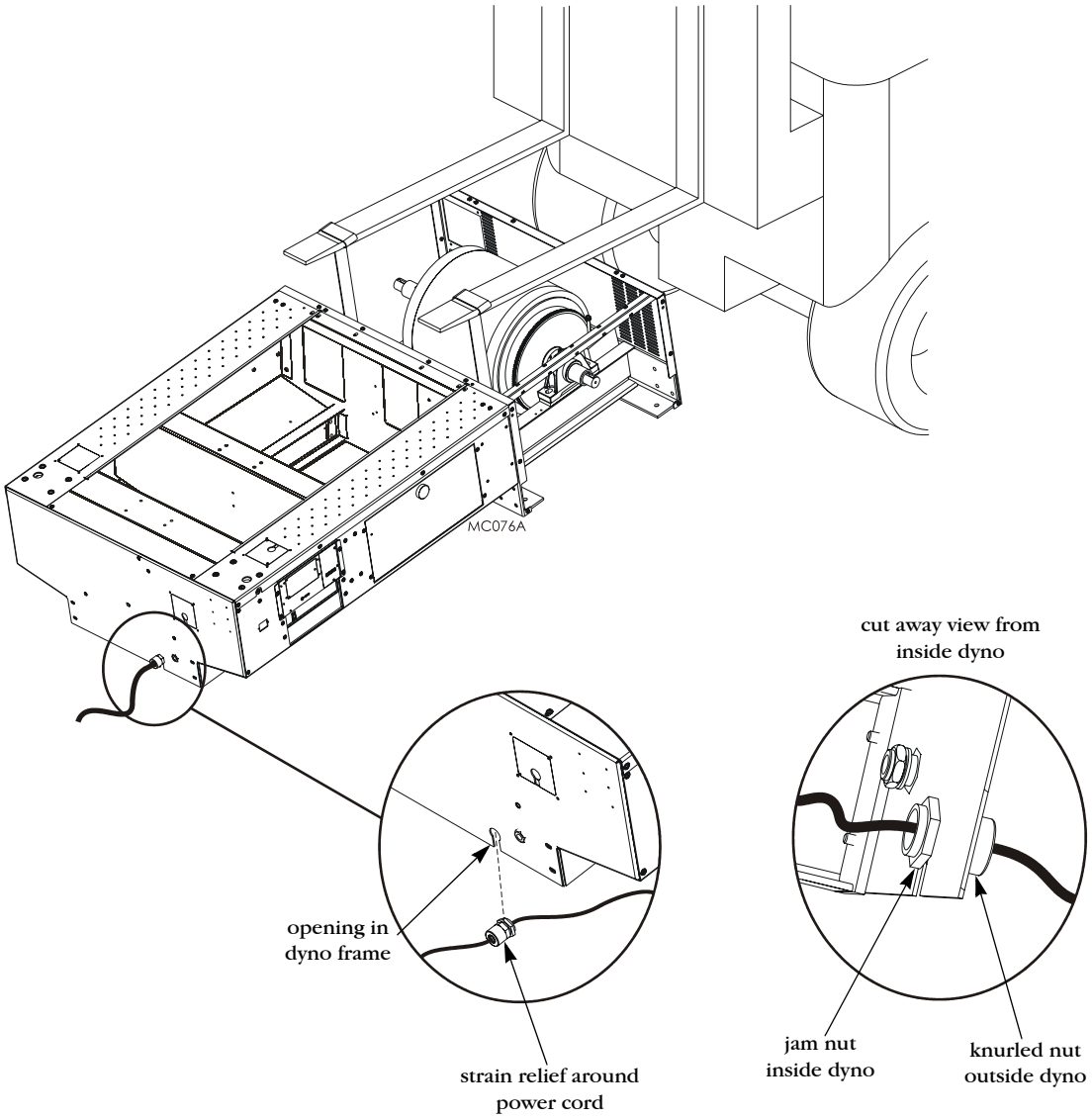


Figure 2-8: Route the Power Cable

PICKUP CARD

The pickup card is an electronic circuit board that accurately senses each drum revolution.

1 Locate the pickup card bracket on the right side of the dyno just ahead of the drum.

2 Install the pickup card to the bracket using two No. 8 screws. Do not tighten, the card must be aligned first.

Note: If your dyno is equipped with an air brake, you will need to attach compressed air and power to your dyno before you can turn the drum. Refer to Figure 3-6 on page 3-7 for more information on attaching compressed air to your dyno.

3 Align the optical pickup card with the tab on the dyno drum axle. Be sure the tab passes freely through the optical pickup. You may need to loosen the bracket to help with alignment.

4 Once aligned, tighten the screws to secure the pickup card in place.

CAUTION

The optical pickup is very delicate. Be careful not to damage the optical pickup during alignment.

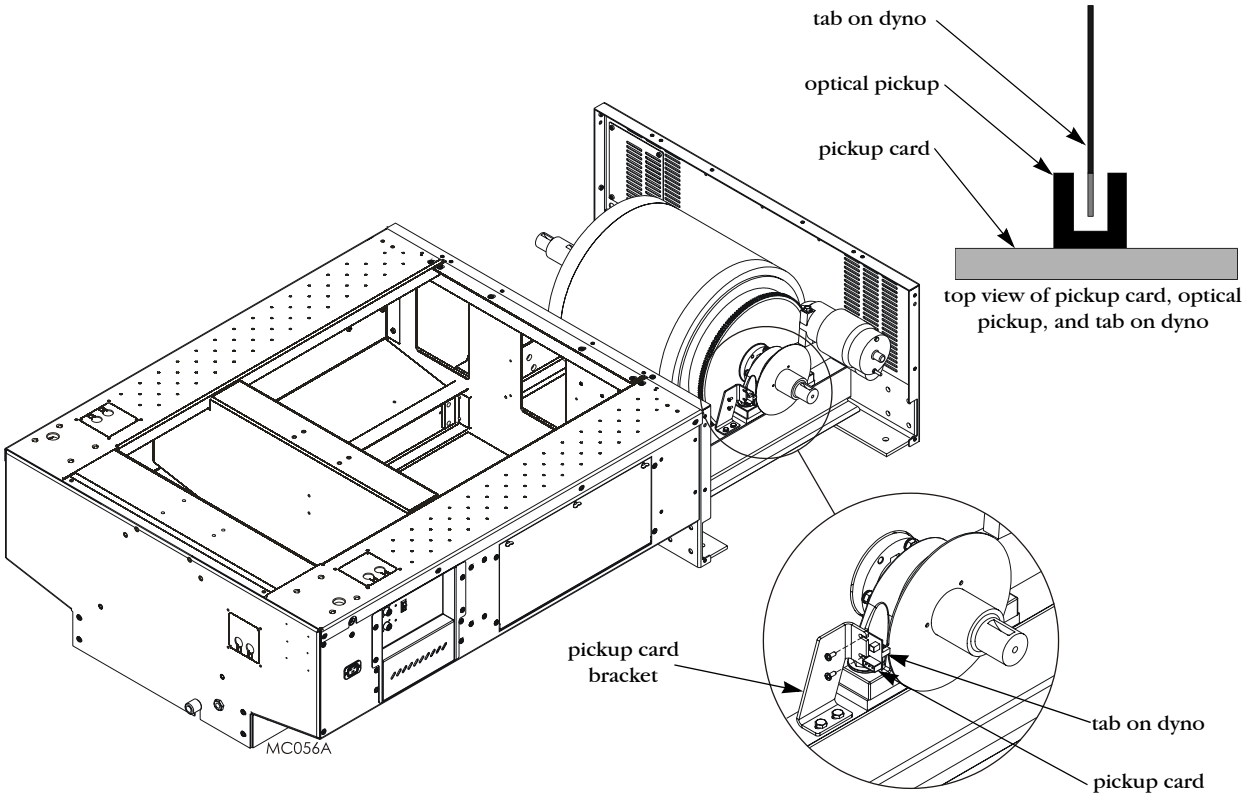


Figure 2-9: Install the Pickup Card

COMPRESSED AIR PUMP ASSEMBLY

This section describes how to install the compressed air pump assembly on your motorcycle dynamometer. For more detailed information, refer to the Compressed Air Air Fuel Ratio Module Installation and User Guide (P/N 98200006).

The following parts are included in P/N 64100002 On Board Compressed Air Air Fuel Ratio Assembly:

- 34100001 Fitting, Tee, 3/8" ID, Brass
- 34200000 Clamp, 5/16" x 1/2-29-32", Screw (3)
- 36561045 Screw, 1/4-20 x 5/8", PH, Torx (4)
- 64193011 Air/Fuel Wand Sub-Assembly

WARNINGS

WARNING

The sensor and the copper sample tube are hot. Before touching the sensor or the sample tube, make sure it has cooled.

CAUTION

Leaded racing fuels and two-stroke applications will contaminate the sensor and dramatically shorten its service life.

The sensor is not covered by a warranty. Be sure to read and understand the Compressed Air Air Fuel Ratio Module Installation and User manual.

Before turning the pump on, verify there is no water in the hose.

Warm up the vehicle before placing the copper sample tube in the exhaust to avoid drawing excess water through the pump assembly.

Keep the air pump assembly upright. Tipping the pump assembly may result in damage to the sensor.

Leaks in the system will result in erroneous readings. Verify there are no cracks or holes in the hose. Verify the sensor is seated properly in the sensor block.

To ensure accurate readings, pump maintenance should be performed every six months, or sooner, depending on usage. Refer to the Compressed Air Air Fuel Ratio Module Installation and User Guide (P/N 98200006).

Compressed Air Requirements

The following requirements are needed for the on-board compressed air pump assembly:

- Clean and dry air, 100 psi or greater, 5 CFM or better flow
- Fittings to hook your air system to a 3/8-inch inside diameter hose (if no air brake is present)
- optional air regulator

Installing the Pump Assembly on the Dyno

1 If not already removed, remove the eight screws securing the drum module panel to the dyno. Set the screws and the panel aside.

2 Secure the pump housing to the dyno using four 1/4-20 torx screws.

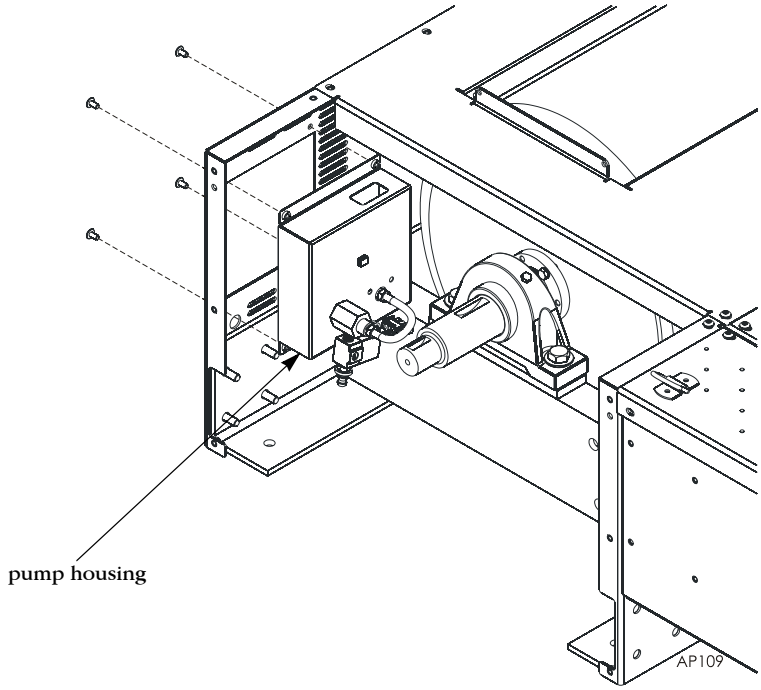


Figure 2-10: Install the Pump Housing

3 Run the provided air hose from the air pump assembly to the front of your dyno. If you have an air brake, refer to “Installing the Air Hose with the Air Brake” on page 2-16.

You will need to remove the carriage assembly and top center cover to route the air hose. Refer to your dyno installation guide for instruction on removing the top cover.

4 Route the air hose through the air access holes in the front of the dyno.

5 Attach the hose to your air supply.

6 Attach the sensor.

7 Attach the silicone hose and copper sample tube to the sensor block.

8 Attach the sensor cable to the corresponding cable from the inside back panel of the dyno.

9 Attach the connector from the pump solenoid to the cable on the inside back panel of the dyno.

10 Replace the top center cover and carriage assembly.

11 Replace the drum module panel using the screws removed earlier.

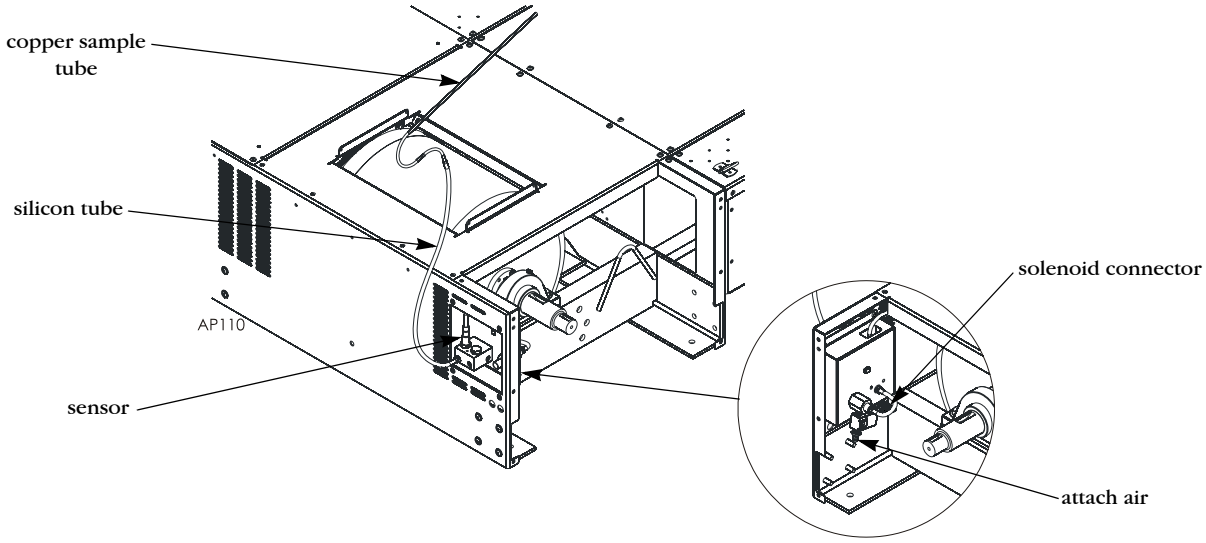


Figure 2-11: Installing the Sensor and Copper Sample Tube

INSTALLING THE AIR HOSE WITH THE AIR BRAKE

Use the following instructions to install the air hose when the air brake is installed.

1 Install the tee.
   1a Cut the hose running from the air brake as shown in Figure 2-12.
   1b Slide a hose clamp over each piece of hose.
   1c Insert the tee.
   1d Secure the hose clamps.
2 Measure the distance from the tee to the air pump assembly and cut a piece of hose.
3 Attach the hose to the air pump assembly. This connection does not require a hose clamp.
4 Slide a hose clamp over the hose.
   Note: The hose clamp is only needed on the tee end.
5 Slide the hose over the tee.
6 Secure the hose clamp.

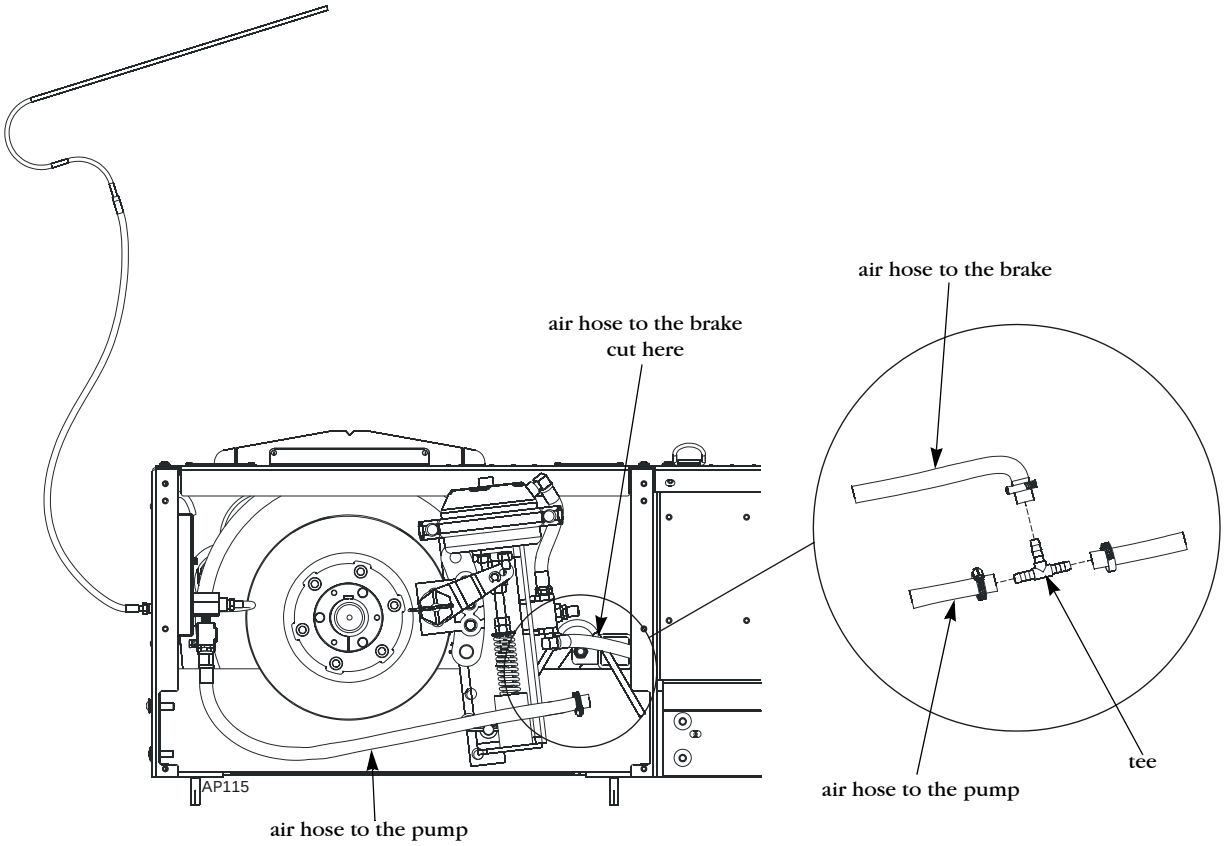


Figure 2-12: Installing the Air Hose with the Air Brake

EDDY CURRENT BRAKE

This section will walk you through removing the eddy current brake (or retarder) from the crate and attaching the brake to your dyno. For more information on routing the temperature sensor cable and the theta controller, refer to “Routing the Eddy Current Brake Cables” on page 2-38.

You will need to provide equipment capable of lifting the eddy current brake off the crate and into position in your dyno room. You will also need a pair of straps. Dynojet recommends using continuous nylon loop style straps.

To prevent possible injury, unplug all power cords and disconnect the battery.

You will need the following parts:

- 36561045 Screw, 1/4-20 x 5/8", PH, Torx (2)
- 36580404 Screw, Set, 3/8-16 x 5/16", w/Tlok (2)
- 37620622 Woodruff Key, 3/8" x 1 3/8"
- 62240070 Driveline Assembly
- 66411003 Theta-2 Controller 240V

UNPACKING THE EDDY CURRENT BRAKE

1 Remove the top and sides of the crate.

2 Remove the four screws securing the top cover and set aside. Remove the cover and set aside.

3 Remove the hardware box and theta controller from the crate and verify the hardware box contents using the parts list.

For more information on mounting the theta controller refer to page 2-24.

RECORD #

Be sure you record the eddy current brake number on the inside cover of this manual.

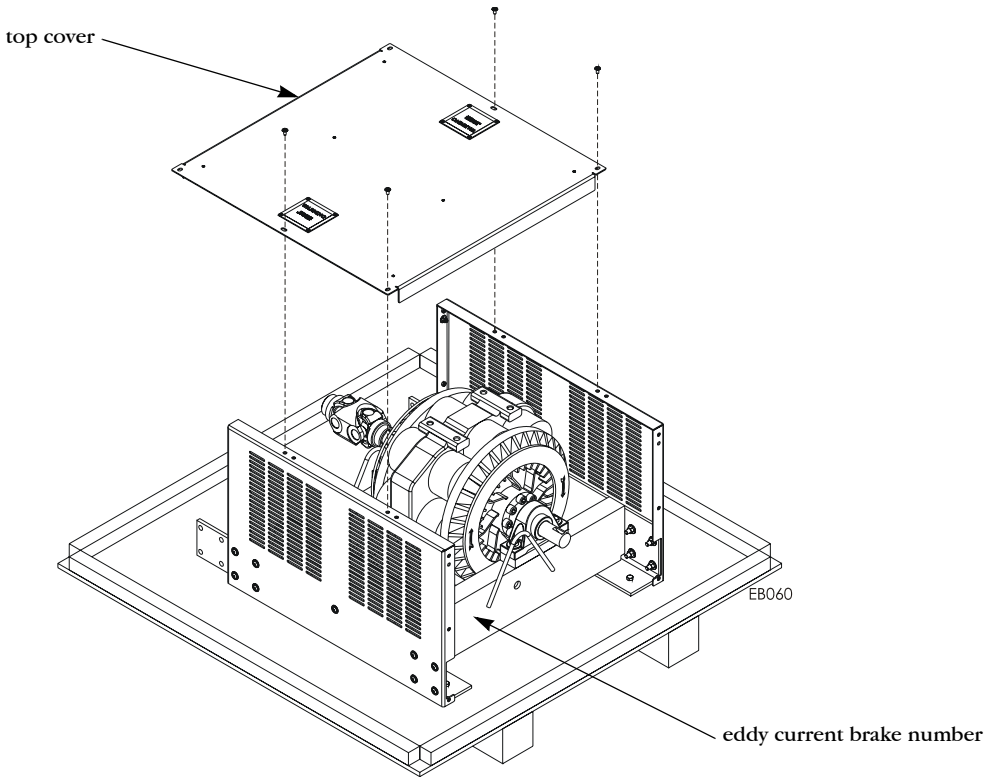


Figure 2-13: Remove the Covers

4 Remove the four bolts securing the brake to the crate.

5 Remove the side drum cover, if not already removed, from the dyno. Refer to Figure 2-4 on page 2-5.

6 Place the nylon loop strap through the lifting eyes on either side of the brake.

7 Using a forklift, lift the eddy current brake from the crate and place the brake near the dyno making sure the panels on the brake and dyno are parallel.

8 Remove the eight bolts, washers, and nuts from the dyno frame where the connector plates will attach.

9 Remove the starter brace, if present.

9a Remove the three bolts, washers, and nuts securing the starter brace and set aside.

9b Remove the starter brace and set aside.

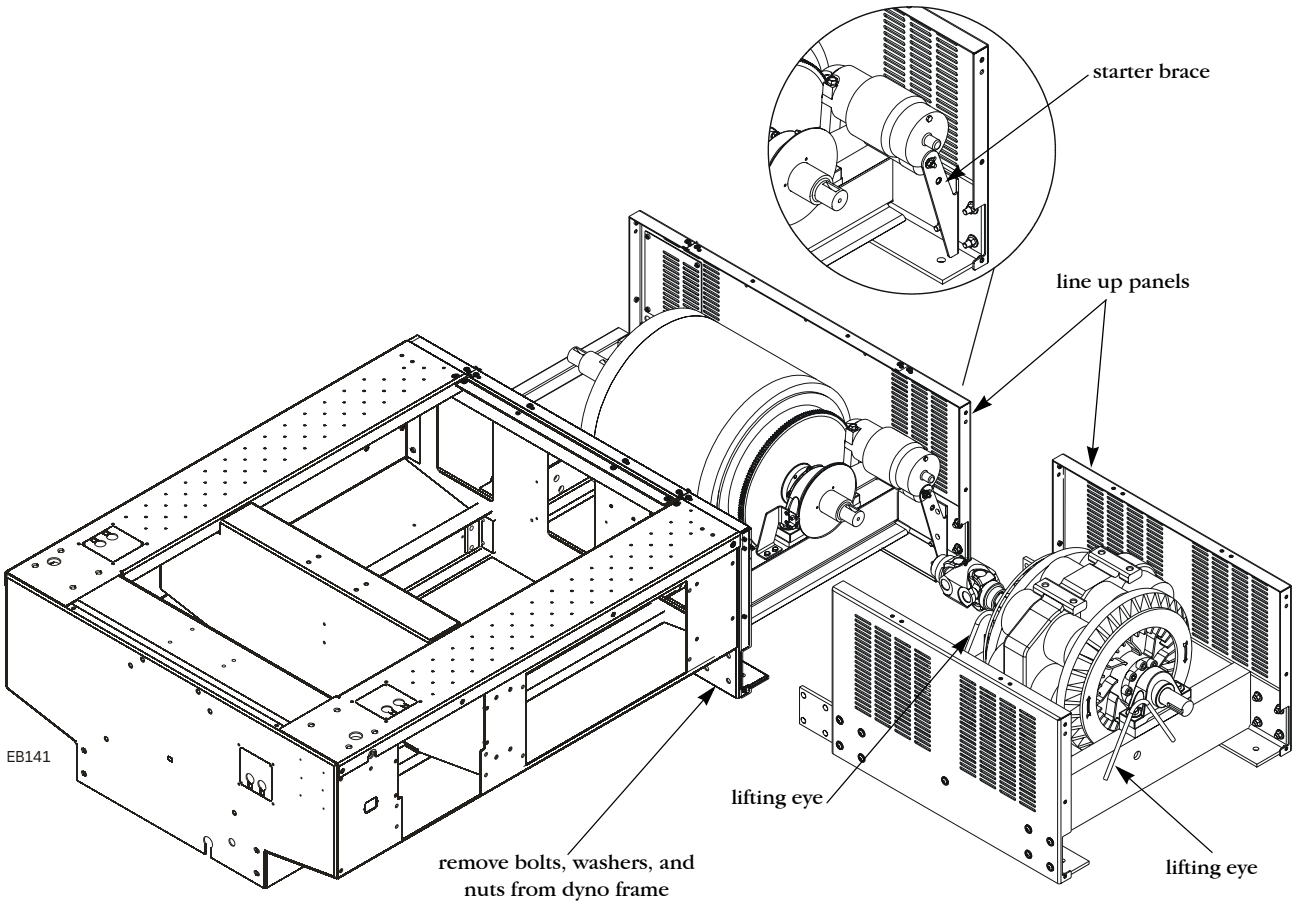


Figure 2-14: Move the Brake Next to the Dyno

INSTALLING THE EDDY CURRENT BRAKE

1 Insert the key into the keyway on the drum shaft.
2 Use a c-clamp to press the key in.

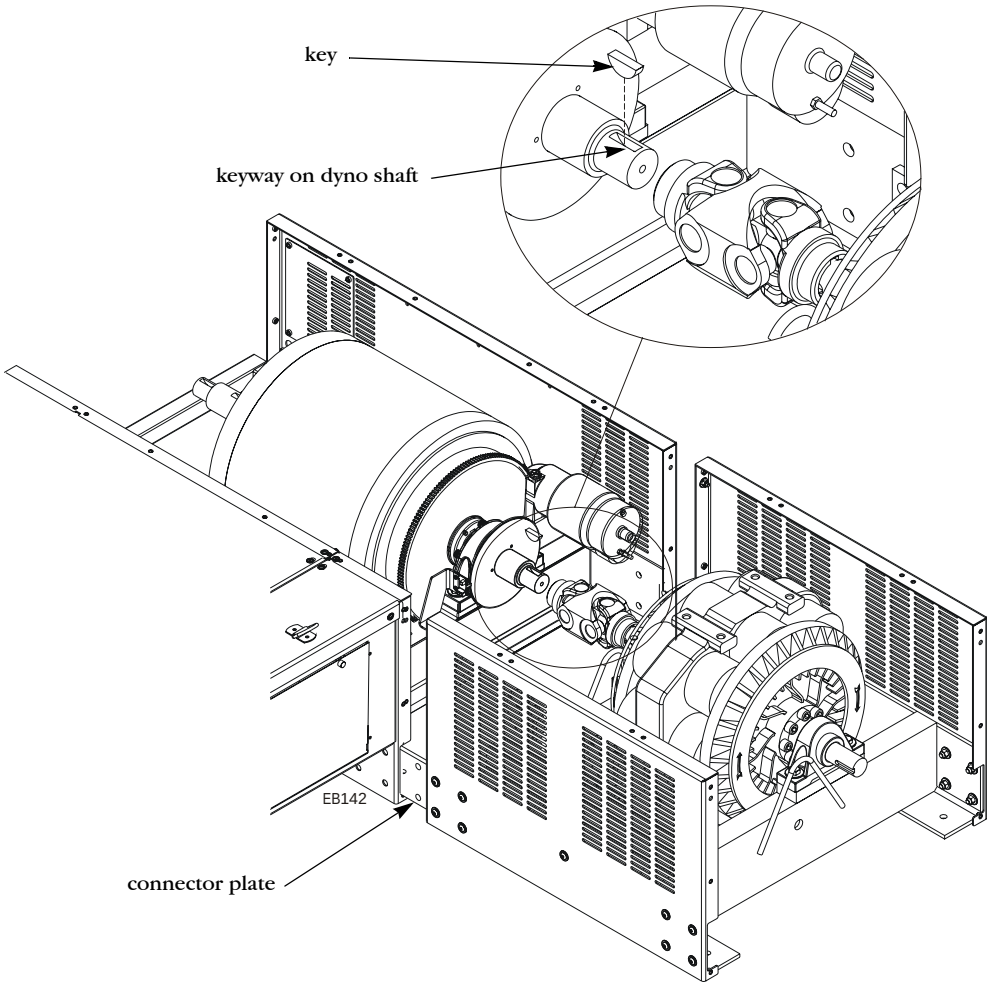


Figure 2-15: Install the Key

3 Keeping the panels parallel, slide the eddy current brake towards the dyno. Slide the driveline assembly over the key on the dyno shaft. You will need to support the driveline assembly as you slide it onto the dyno shaft.

4 Continue sliding the eddy current brake towards the dyno until the covers on the brake and dyno are flush.

5 Loosely secure the connector plates to the dyno frame using the eight bolts, washers, and nuts removed earlier.

Note: Do not tighten the bolts.

6 Verify the covers on the brake and the dyno line up. These covers must be flush and parallel. If these covers are not flush, place shims between the floor and the eddy current brake or the dyno until they are flush.

7 Once aligned, tighten all connector plate bolts and nuts.

8 Secure the starter brace to the starter using the washer and nut removed earlier.

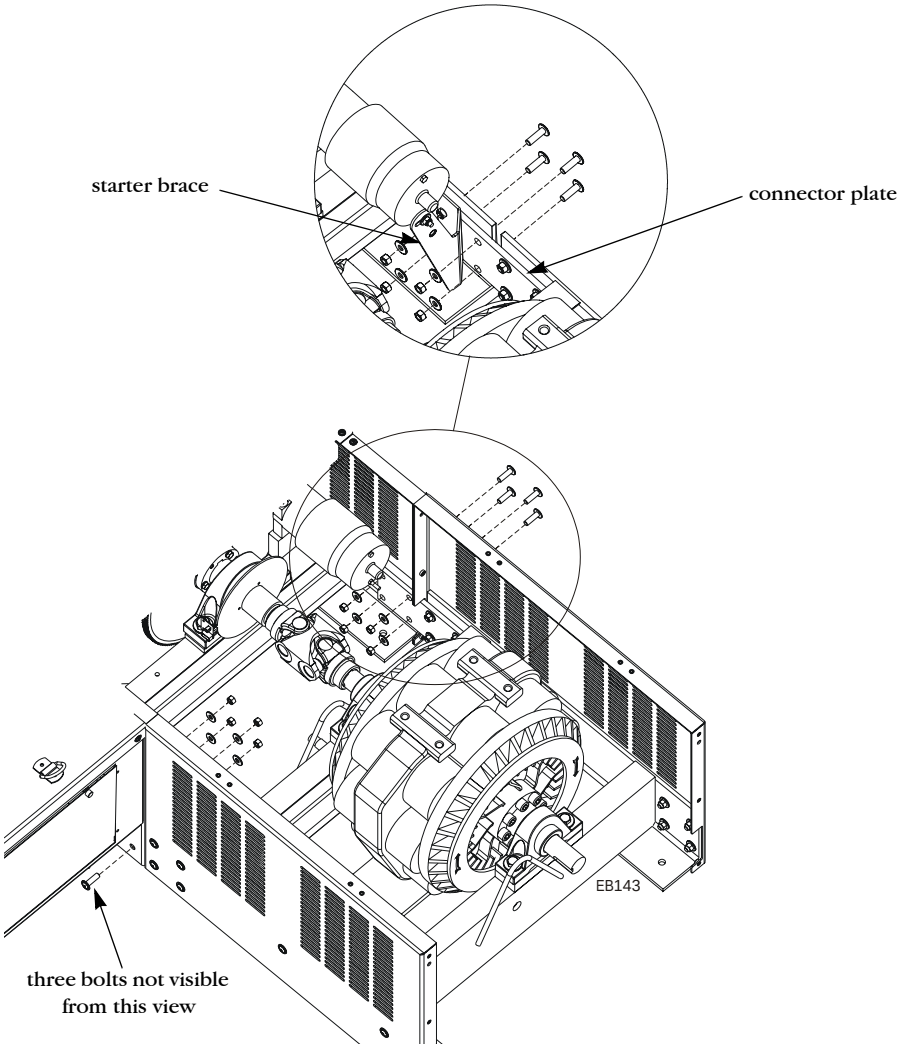


Figure 2-16: Secure the Connector Plates and Starter Brace

9 Secure the side panels on the eddy current brake to the panels on the dyno using a 1/4-20 x 5/8-inch screw. Do this on each side.

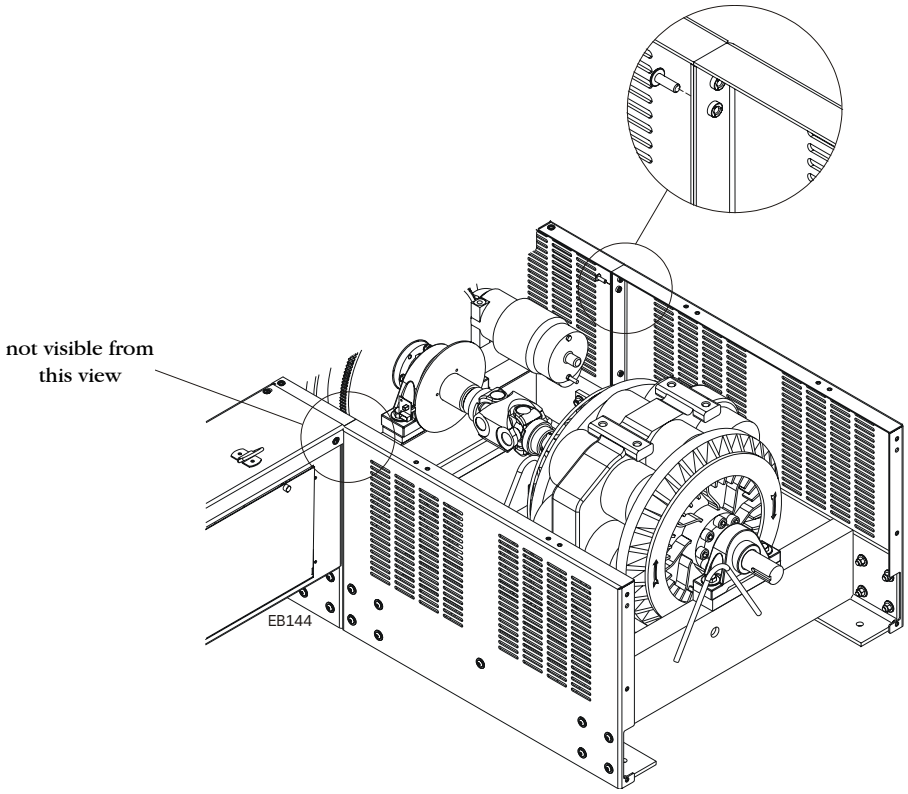


Figure 2-17: Secure the Side Panels to the Dyno

10 Replace the existing set screws on the driveline assembly with the thread-lock set screws provided.

11 Tighten the driveline assembly set screws.

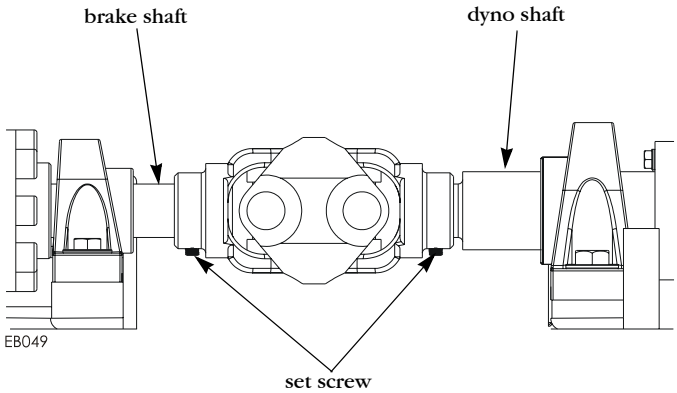


Figure 2-18: Tighten the Set Screws

SECURING THE DRUM AND BRAKE MODULE TO THE FLOOR

Dynojet recommends you anchor the eddy current brake, along with the dyno, to the floor in your dyno room using concrete anchors. You will want to drill the holes and secure the dyno before placing the covers on your dyno.

You will need the following parts:

- 37513200 Anchor, Redhead, 3/8" (7)
- DM150-002-007 Washer, 5/16", Flat (7)
- DM150-019-012 Bolt, 3/8-16 x 1", Hex (7)

1 Mark and drill each hole needed to secure the drum and brake modules to the pit floor.

2 Install the Red Head anchors. Refer to Appendix A for installation instructions.

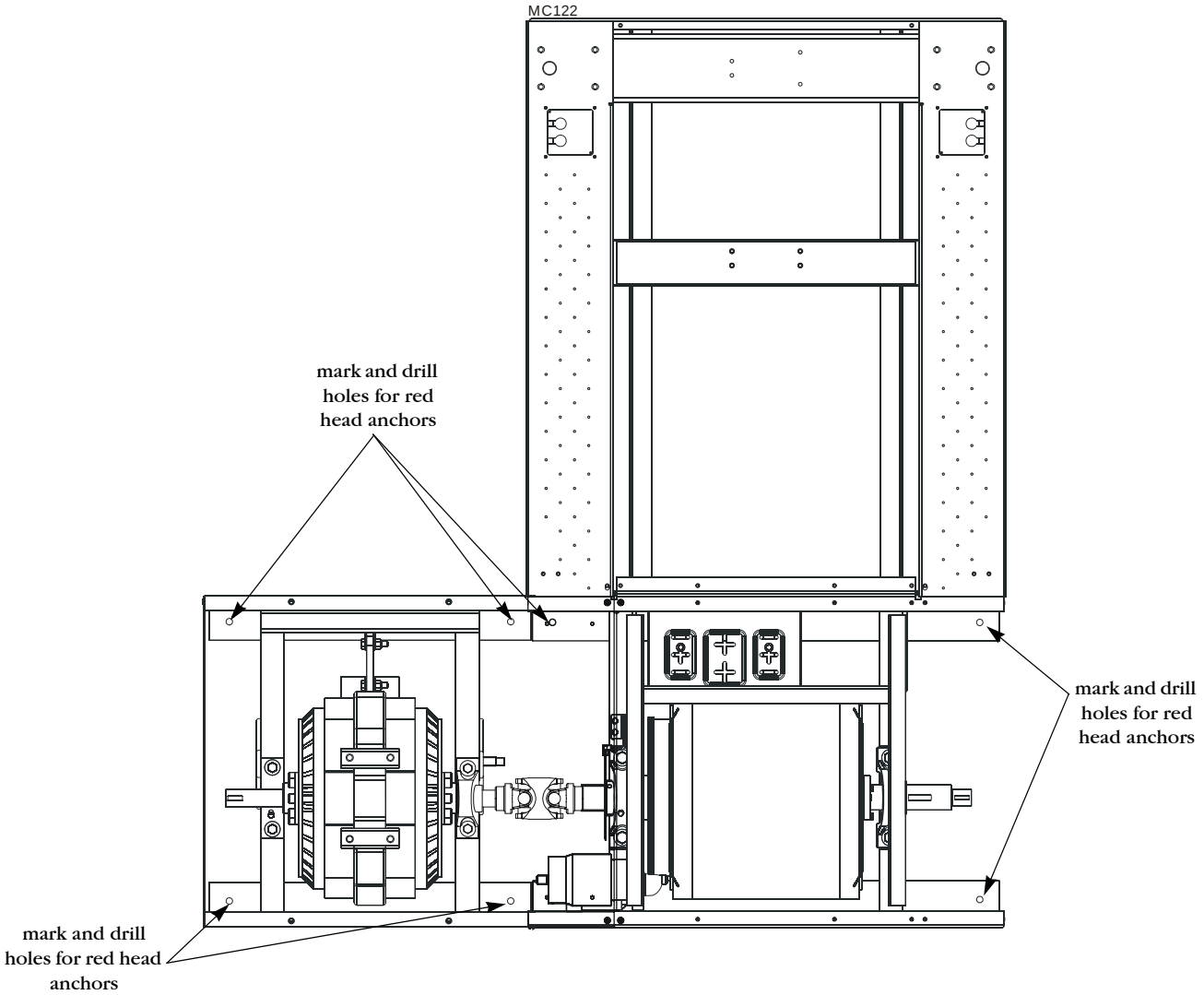

MC122
mark and drill holes for red head anchors
mark and drill holes for red head anchors
mark and drill holes for red head anchors

Figure 2-19: Secure the Dyno and Brake Module to Floor

INSTALLING THE THETA CONTROLLER

The theta controller is the interface between the eddy current brake and the dyno electronics. The theta controller is shipped in the eddy current brake crate.

Note: The theta controller may already be installed.

1 Verify the theta controller dip switch settings. Refer to Appendix C for more information.

2 Secure the theta controller to the drum module bulkhead using four 8-32 x 3/8-inch screws.

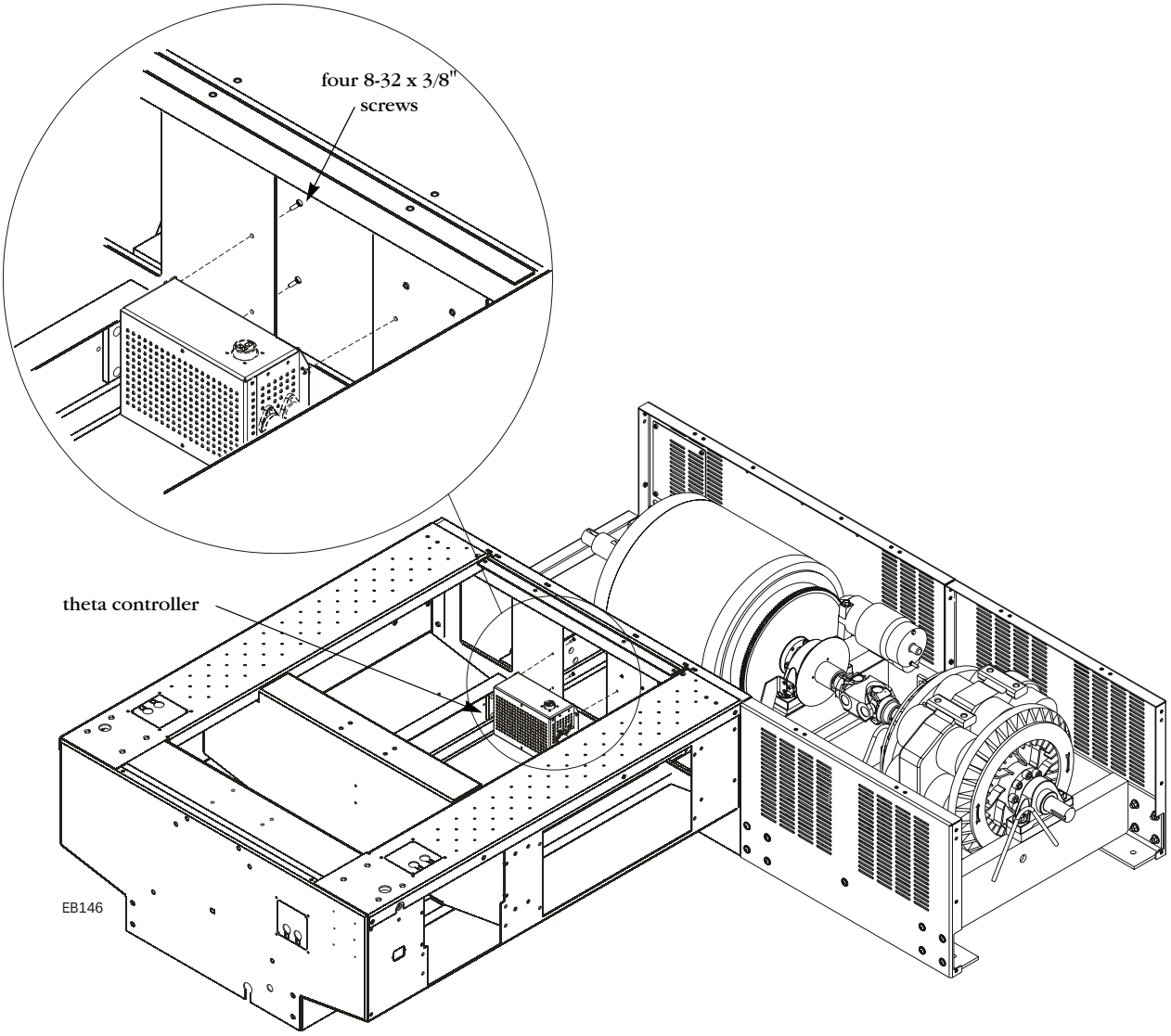


Figure 2-20: Installing the Theta Controller

REMOVE THE DYNO COVERS

1 Remove the five screws securing the top cover to the dyno and set aside. Remove the top cover and set aside.

2 Remove the twelve screws securing the side cover to the dyno and set aside. Remove the side cover and set aside.

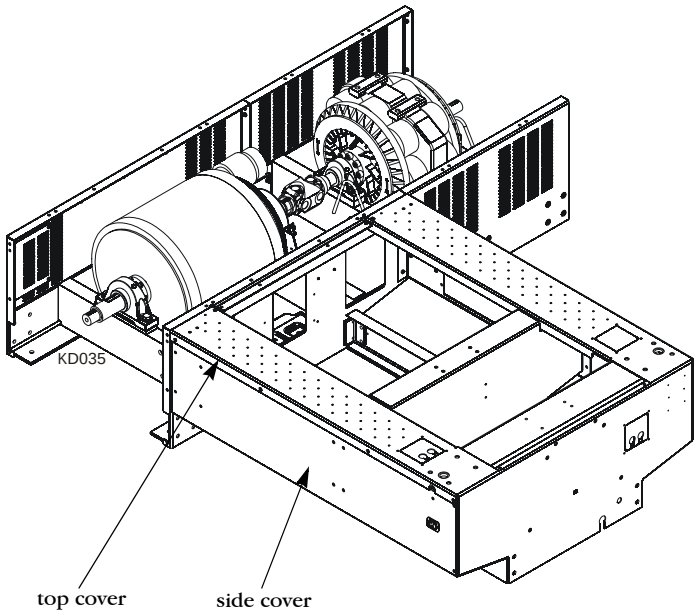


Figure 2-21: Removing the Dyno Covers

IX DRUM MODULE INSTALLATION

Examine the exterior of the shipping container for any visible damage. If damage is detected at this stage, contact the shipper or Dynojet before proceeding with unpacking.

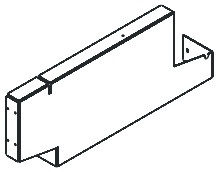
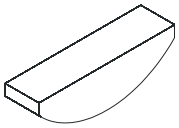
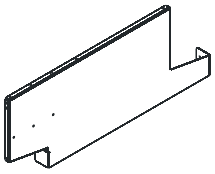
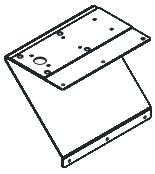
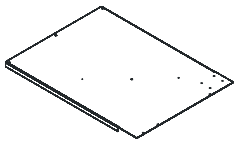
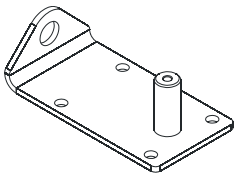
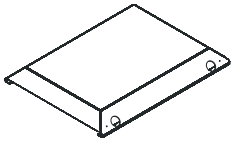
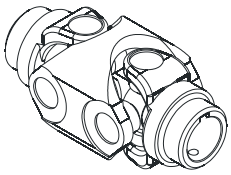
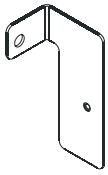
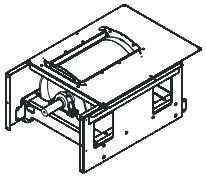
Use the following steps to unload and install the iX drum module and related items. You will need to provide equipment capable of lifting a minimum of 363 kg. (800 lb.) to move the crated drum into position in your dyno room.

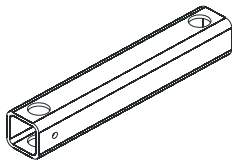
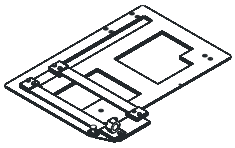
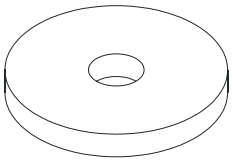
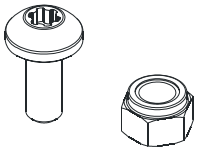
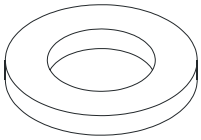
Removing the Items from Crate

1 Move the crate to a clear area near your dyno room.

2 Using a pry bar, or a large flat screwdriver, and a hammer, carefully remove the top and sides of the crate.

3 Remove the following parts from the crate and set aside.

part	description	part	description
	bulkhead support P/N 21200022		woodruff key, 3/8 x 1-3/8" P/N 37620622
	decking front panel P/N 21200024		monitor support brace P/N 61300007
	center panel P/N 21200037		fan arm mount (2) P/N 61300009
	drum safety cover P/N 21200038		driveline assembly P/N 62240070
	toe kick bracket P/N 21600012		drum module P/N 63200001

part	description	part	description
	lower blower arm (2) P/N 21600015		trike carriage adapter assembly P/N 71300002
	washer, 1.5 x .38 ID x .187 THK (2) P/N 26215220		bolt kit P/N 79100000
	washer, 1.87 x 1.25 ID x .25 THK (2) P/N 26215521		

4 Remove the crate braces that support the top portion of the crate.

5 Remove the four lag bolts and washers securing the drum to the crate base using a 9/16-inch socket, open or box end wrench.

INSTALLING THE iX DRUM MODULE

You will need the following parts:

- 36561045 Screw, 1/4-20 x 5/8", PH, Torx (2)
- 37620622 Woodruff Key (2)
- 62240070 Driveline Assembly
- 63200001 iX Drum Module

1 Remove the drum safety cover from the iX drum module.

2 Remove the six screws securing the iX drum cover and set aside. Remove the cover and set aside.

RECORD #

Be sure you record the iX drum module number on the inside cover of this manual.

3 Place the nylon loop strap around the shaft on either side of the drum module.

4 Using a forklift, lift the drum module from the crate and place the drum module near the dyno with the stepped end of the shaft towards the dyno. Make sure the panels on the drum module and the dyno are parallel.

5 Remove the two existing screws from the dyno frame where the connector plates will attach.

6 Insert the woodruff key into the keyway on the drum module shaft.

7 Insert the woodruff key into the keyway on the dyno shaft.

8 Slide the driveline over the key on the drum module shaft.

9 Keeping the panels parallel, slide the drum module towards the dyno. Slide the driveline over the key on the dyno shaft. You will need to support the driveline as you slide it onto the dyno shaft.

10 Continue sliding the drum module towards the dyno until the side panels on the drum module and the dyno are flush.

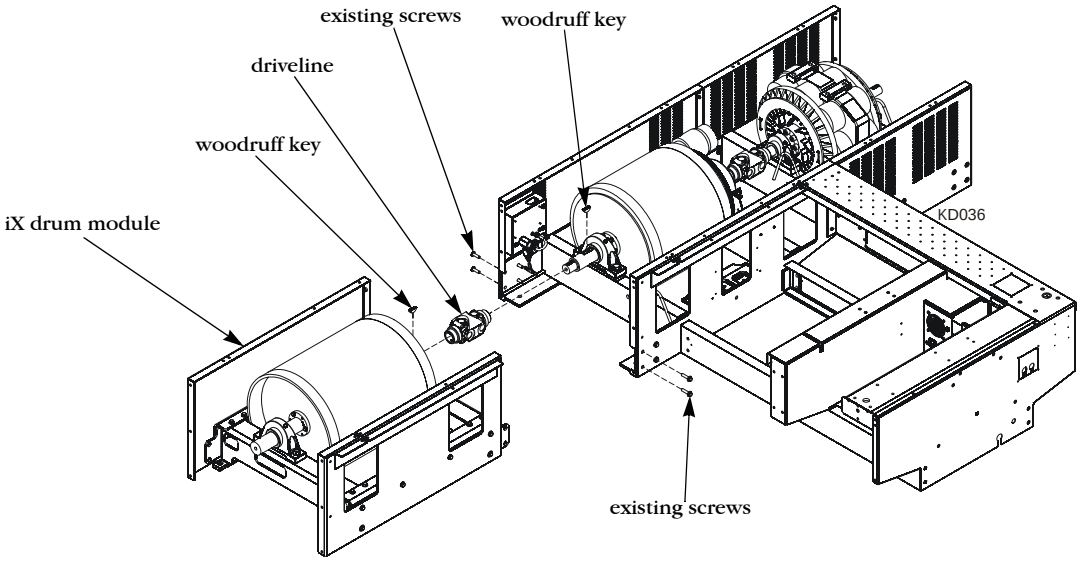


Figure 2-22: Installing the Driveline and the Drum Module

11 Secure the connector plate on either side of the drum module to the dyno frame using the screws removed earlier.

12 Verify the panels on the drum module and the dyno line up. These covers must be flush and parallel. If these covers are not flush, place shims between the floor and the drum module or the dyno until they are flush.

13 Once aligned, tighten all screws.

14 Secure the side panels on the drum module to the panels on the dyno using one 1/4-20 x 5/8-inch screw.

15 Replace the existing set screws on the driveline assembly with the thread-lock set screws provided.

16 Tighten the driveline set screws.

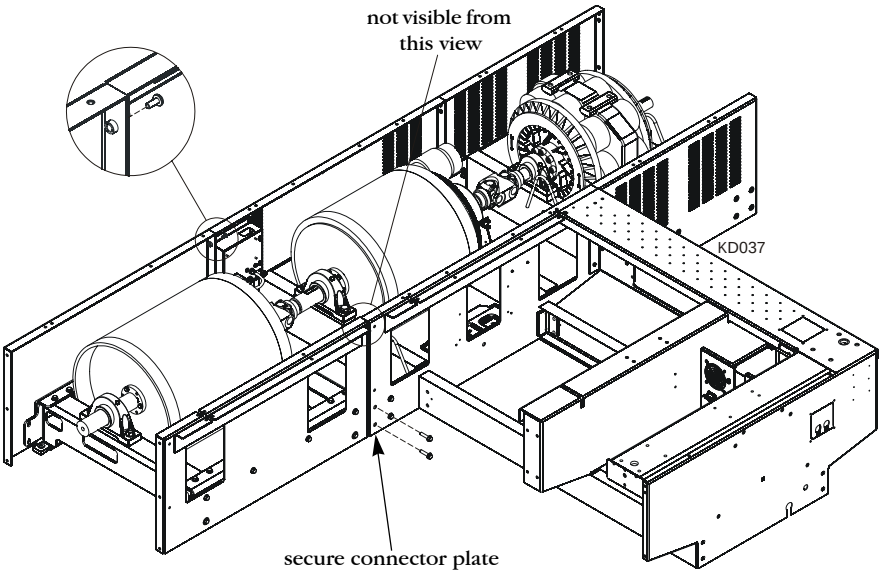


Figure 2-23: Securing the Drum Module to the Dyno

INSTALLING THE BULKHEADS

You will need the following parts:

- 21200022 Middle Bulkhead
- 21200024 Front Bulkhead
- 21600012 Toe Kick Bracket
- 36468100 Nut, 1/4-20, Nylock (5)
- 36561045 Screw, 1/4-20 x 5/8", PH, Torx (16)
- 61300007 Monitor Support Brace
- 76950053 Cable, Fan Power Extension

1 Place the monitor support brace on the five studs on the front bulkhead.

2 Secure the brace to the studs using five 1/4-20 nylock nuts.

3 Secure the front bulkhead to the dyno frame using four 1/4-20 x 5/8-inch pan-head screws.

4 Secure the middle bulkhead to the dyno frame using five 1/4-20 x 5/8-inch pan-head screws.

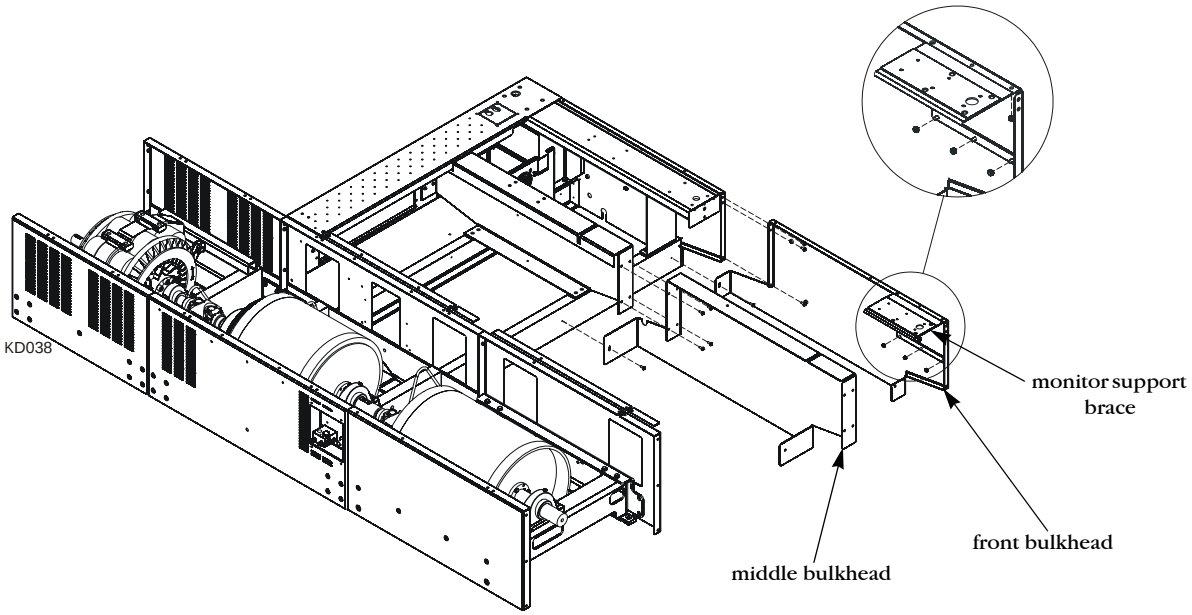


Figure 2-24: Securing the Front and Middle Bulkheads

5 Remove the existing 3/8-inch screw from the drum module and secure the toe kick bracket to the drum module.

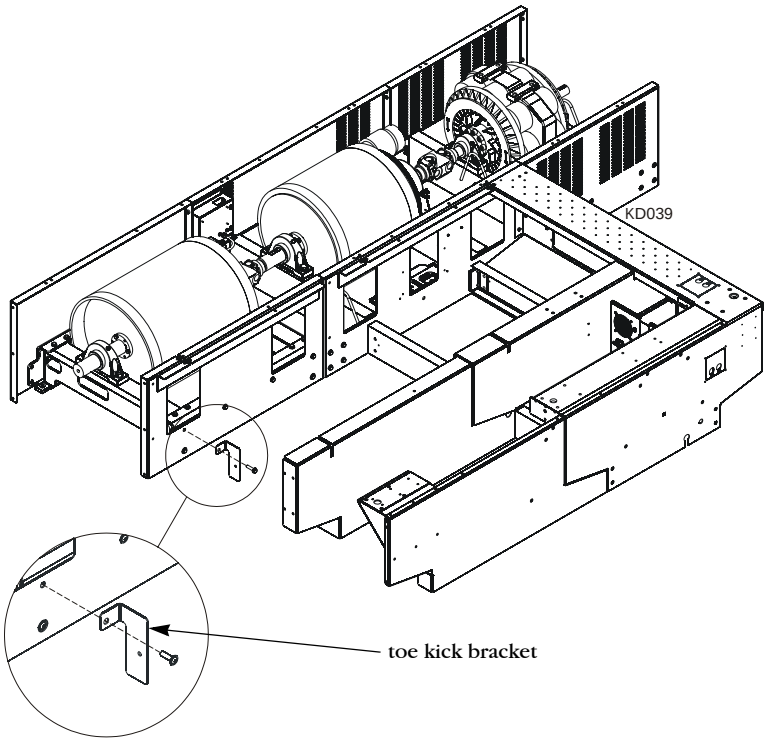


Figure 2-25: Securing the Toe Kick Bracket

6 Attach the blower extension cable to the existing blower cable, disconnected earlier, by matching up the colors.

7 Attach the blower extension cable to the fan socket.
- Connect the brown wire to N
- Connect the blue wire to L
- Connect the green/yellow wire to ground

8 Secure the dyno side cover to the bulkheads using the eleven screws removed earlier

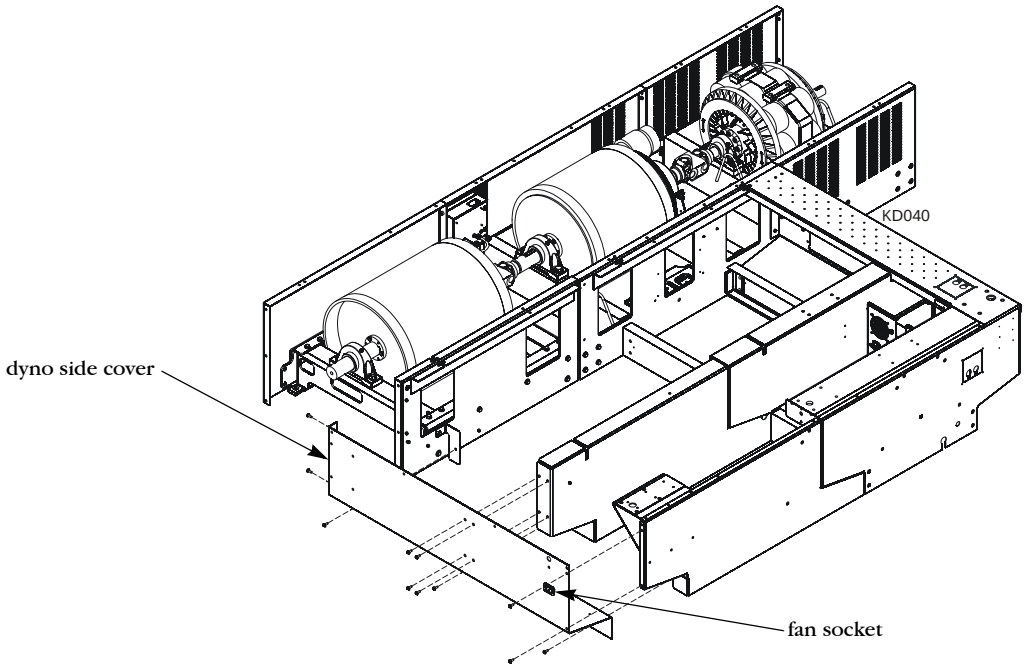


Figure 2-26: Securing the Dyno Side Cover

9 Secure the dyno top cover to the bulkheads using the five screws removed earlier.

10 Secure the drum side cover to the drum module using the eight 1/4-20 x 5/8-inch button-head screws removed earlier.

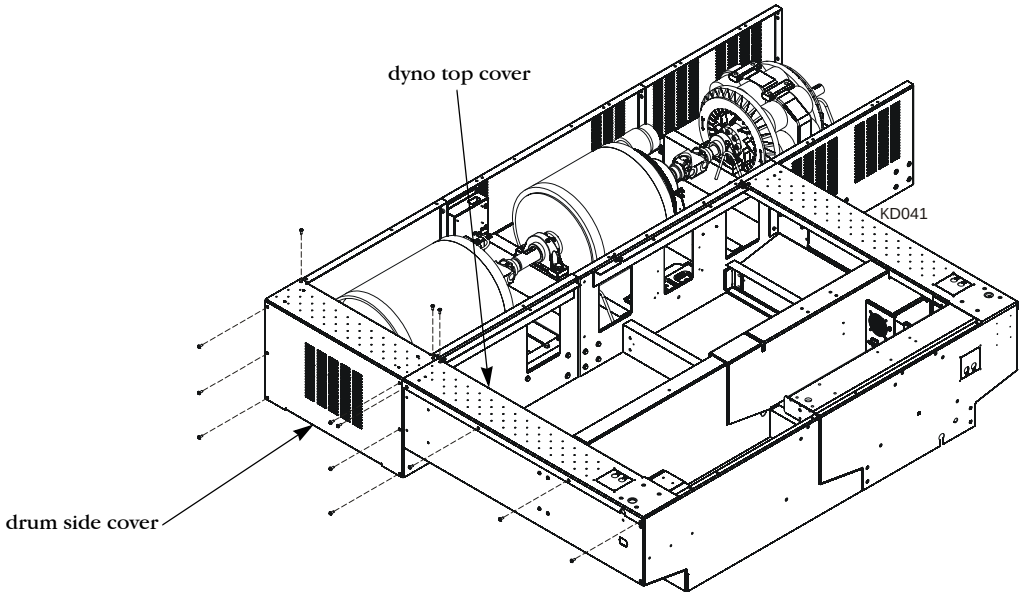


Figure 2-27: Securing the Dyno Top Cover and Drum Side Cover

ROUTING CABLES

For the following instructions, the support arm and control panel are shown mounted on the left side of the dyno.

Open the control panel interface (CPI) front panel to access the breakers and Breakout board.

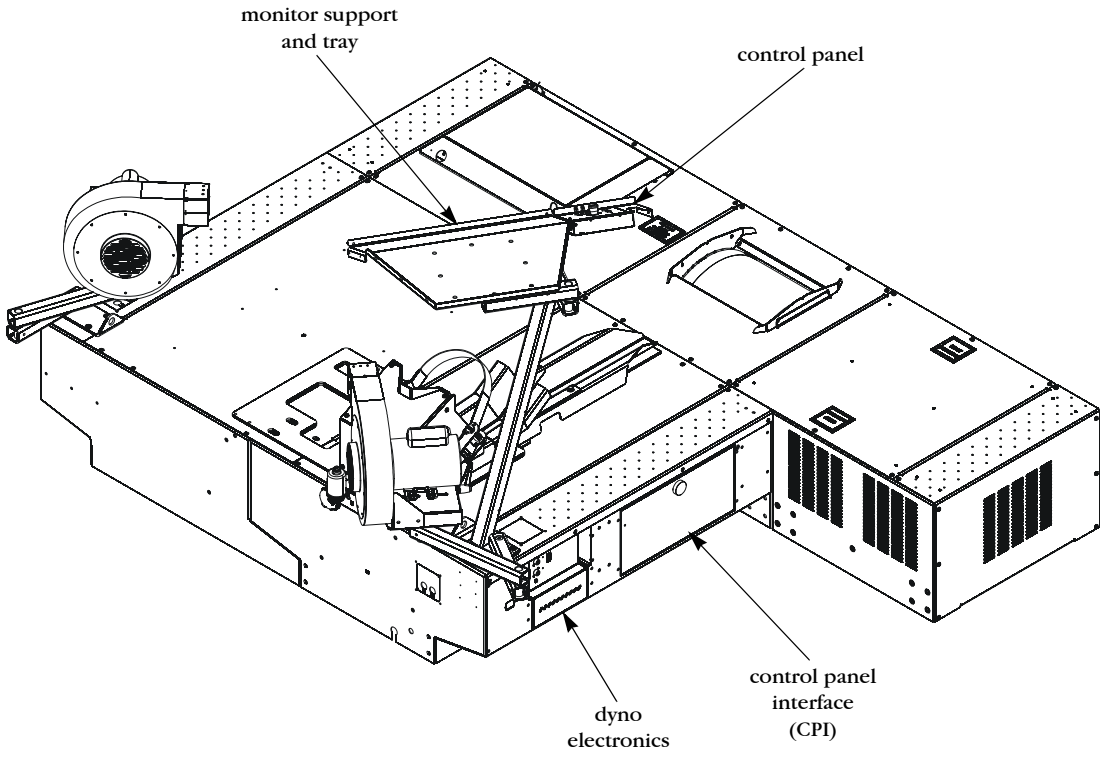


Figure 2-28: Dyno Room Layout

BATTERY REQUIREMENTS

The model 200iX/250iX dyno is designed to carry a group 24 deep cycle discharge series battery for operating the starter, optional power carriage, and optional wheel clamp. The typical dimensions for this series of batteries are 10 5/8-inches long by 6 3/4-inches wide by 9 1/8-inches tall. The mounting is flexible so a battery that has dimensions close to this will work satisfactorily. The built in battery cables are configured for top post batteries. This battery is not included with your dyno. You will need to provide this battery.

The battery provides the necessary energy to run the starter, optional power carriage, and optional wheel clamp. The CPI has a built in battery charging circuit to keep the battery charged. Each time the starter, power carriage, or wheel clamp is used, this built in charging circuit will recharge the battery. The charging rate is sufficient to keep up with loading a bike, operating the wheel clamp, and adjusting the power carriage every five minutes. Recharging from use of the built in dyno starter will take longer. Do not add any external battery chargers to the car battery.

> **Note:** If you do not install the battery make sure the positive battery cable is insulated from the chassis as the charging circuit is always providing charging current whenever the dyno main power breaker is turned on.

The battery charging circuit is active anytime the main power on the dyno is turned on. If the main breaker is turned off then the battery will not be charged. Frequent use of the starter will quickly deplete the battery and it may need several hours of the internal charging to bring the battery back to a full charge.

For more information on installing the battery, refer to page 2-36.

> **Note:** If you do not wish to use the wheel clamp and the power carriage or operate the built-in starter then it is not necessary to install the battery.

USING A BATTERY CHARGER

In order to utilize the starter on dynos that do not have the Control Panel, you will need to provide an on board battery charger. A small trickle charger or battery minder is sufficient in the charging range of 1A. Verify the battery charger does not overcharge the battery when left attached.

> **Note:** Dynojet recommends using a ring connector style charger.

- Using the bolts from the battery terminals, secure the ring connectors from the charger to the battery terminals.
- Secure the charger in a safe location in the dyno.
- Route the power cable out of the dyno. Make sure the cable cannot be damaged.

These small chargers should be available from your normal distribution supply chain or other sources such as NAPA, JC Whitney, or Northern Tools.

CAUTION

There is danger of explosion if the battery is incorrectly replaced. Wear protective clothing, eye, and face protection when charging or handling batteries. Refer to Warnings for more information.

INSTALLING THE BATTERY

1. Locate the red battery cable on the inside of the dyno.
2. Place the battery in the battery carrier on the inside of the dyno so the red cable can reach the positive (+) post on the battery and the black battery cable can reach the negative (-) post.
3. Secure the red battery cable to the positive (+) battery post.
4. Secure the black battery cable to the negative (-) battery post.
5. Secure the battery to the tray with the battery hold-down.

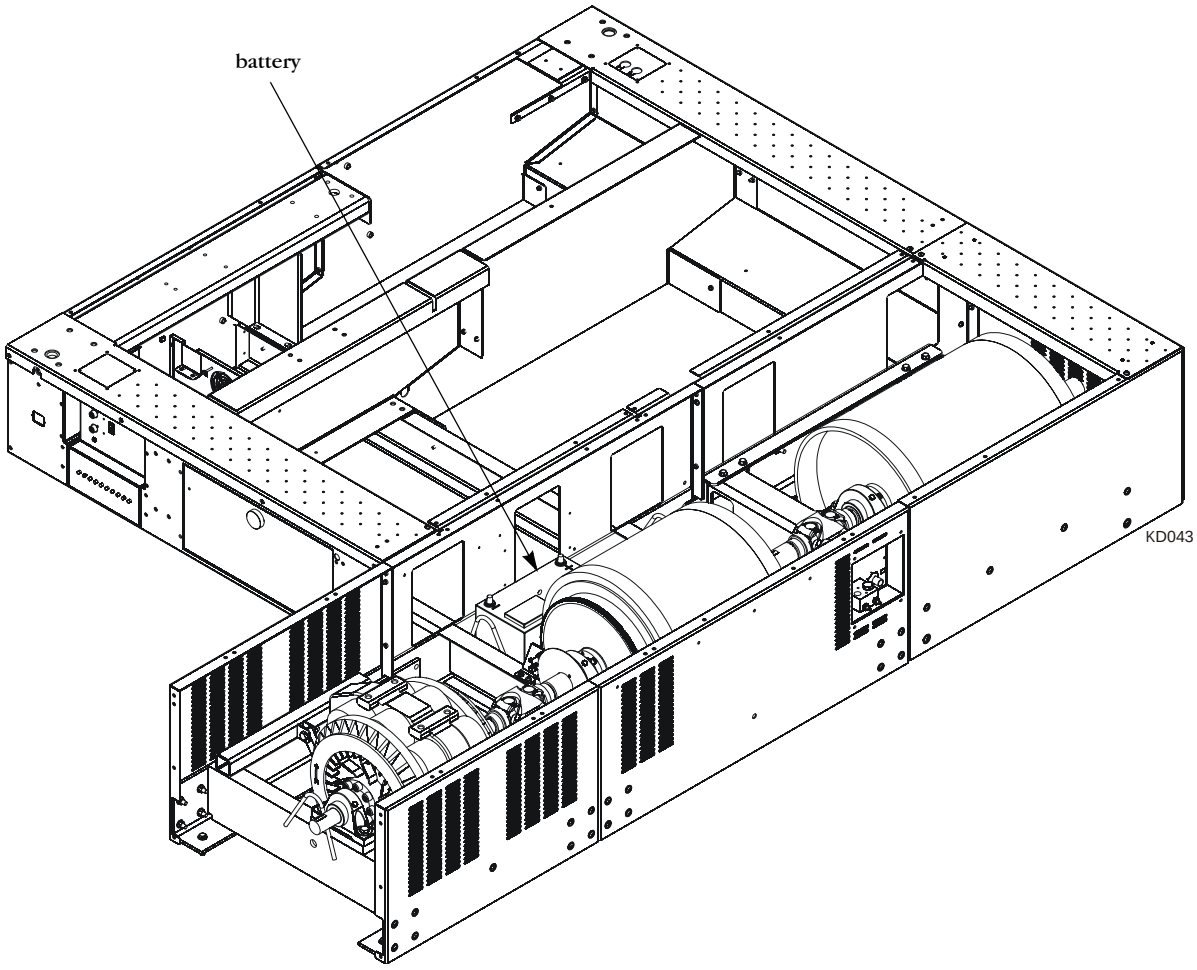


Figure 2-29: Install the Battery

ROUTING THE PENDANT, RS232 COMPUTER CABLE, AND CONTROL PANEL CABLE

1 Remove the two screws securing the cable pass through cover (shown in Figure 2-30) closest to the monitor support and set it aside. The cables you will route will be coiled inside the chassis.

2 Route the pendant cable, 9-pin RS232 computer cable (P/N 42967090), and the 15-pin control panel cable, labelled Button Panel P1, from the dyno electronics CPU Module through the cable pass through cover on the side closest to where you installed your monitor arm.

3 Place a split snap bushing around the pendant cable and the RS232 cable and secure them through one hole in the cable pass through cover.

4 Place a split snap bushing around the control panel cable and secure it in the other hole on the cable pass through cover. The bushing should be around the cable protective wrap.

5 Secure the cable pass through cover to the dyno with the two screws removed earlier.

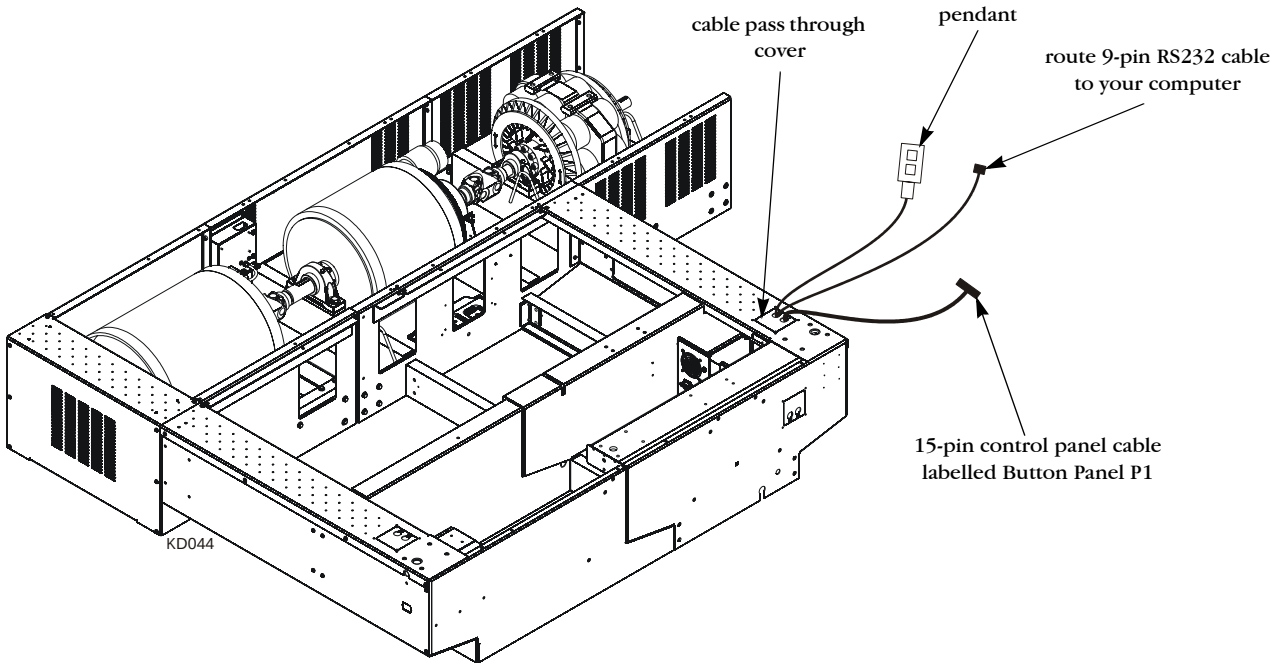

cable pass through cover
pendant
route 9-pin RS232 cable to your computer
15-pin control panel cable labelled Button Panel P1
KD044

Figure 2-30: Route the Control Panel and Pendant Cables

ROUTING THE EDDY CURRENT BRAKE CABLES

1 Attach the input power cable (P/N 66952004) to the top of the theta controller.

2 Route the eddy current brake cable (P/N 66952003) from the eddy current brake to the bottom of the theta controller.

3 Route the control cable from the theta controller out of the side of the dyno chassis to the Breakout board through the hole in the CPI shown in Figure 2-31.

4 Route the temperature sensor cable from the eddy current brake through the air hole in the drum bulkhead, through the opening on the side of the CPI, and over to the Breakout board.

Note: For more information on wiring the Breakout board refer to page 2-39.

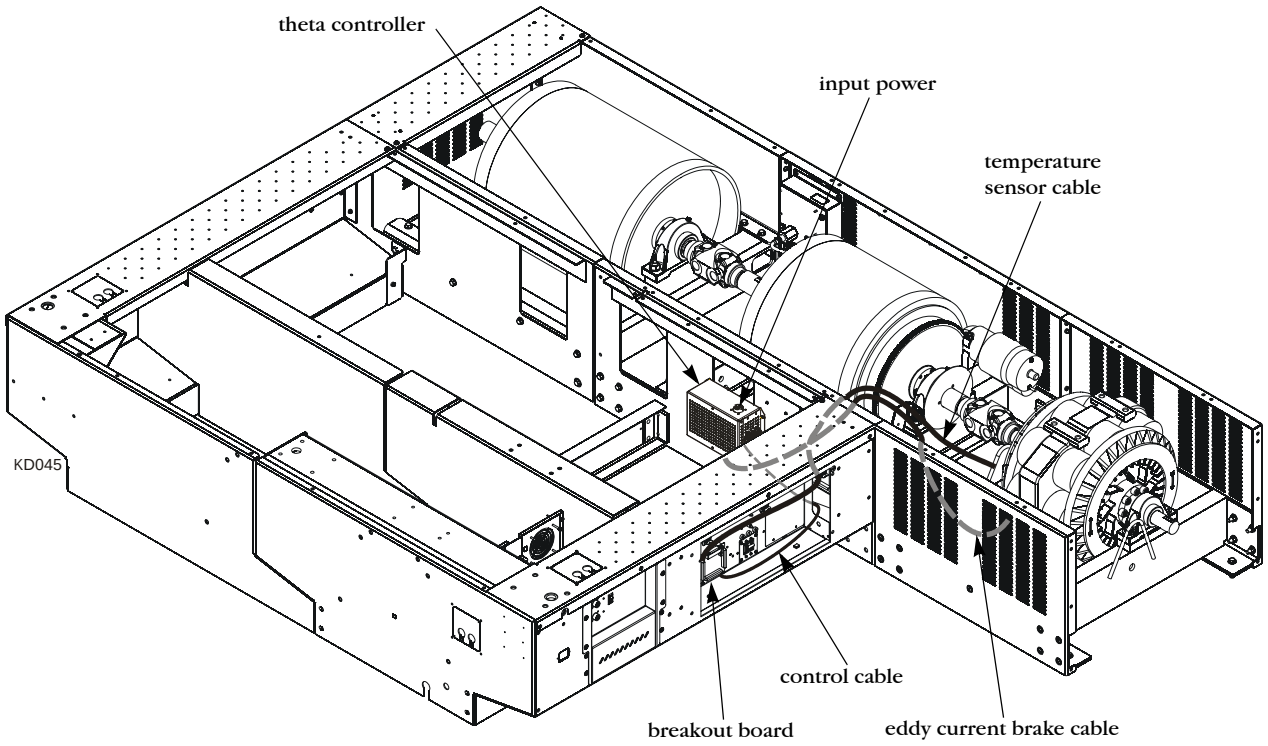


Figure 2-31: Route the Eddy Current Brake Cables

WIRING THE BREAKOUT BOARD

1 Attach the temperature sensor cable to the Breakout board. The temperature sensor cable has five wires which connect to the wiring block labeled TEMP. This cable was routed to the Breakout board on page 2-38.

- Green wire connects to G1
- White wire connects to W1
- Black wire connects to B1
- Red wire connects to R1
- Ground (shield) wire connects to S1

2 Attach the theta controller cable to the Breakout board, if it is not already connected. The theta controller cable has five wires which connect to the wiring block labeled LOAD CONTROL.

- Black wire connects to V-
- Red wire connects to V+
- White wire connects to O+
- Green wire connects to O-
- Ground (shield) wire connects to SH

3 Attach the pickup card cable to the Breakout board. The pickup card cable has four wires which connect to the wiring block labeled DRUM 1.

- Red wire connects to R1
- Black wire connects to B1
- White wire connects to W1
- Ground (shield) wire connects to S1

4 Verify jumpers J1 and J2 are set either for the eddy current brake and air brake or for the air brake only as shown in Figure 2-32.

If you have an eddy current brake and air brake, the air brake will only be activated when the dyno electronics power is turned off or the optional door interlock is installed and activated.

5 Close the CPI enclosure door.

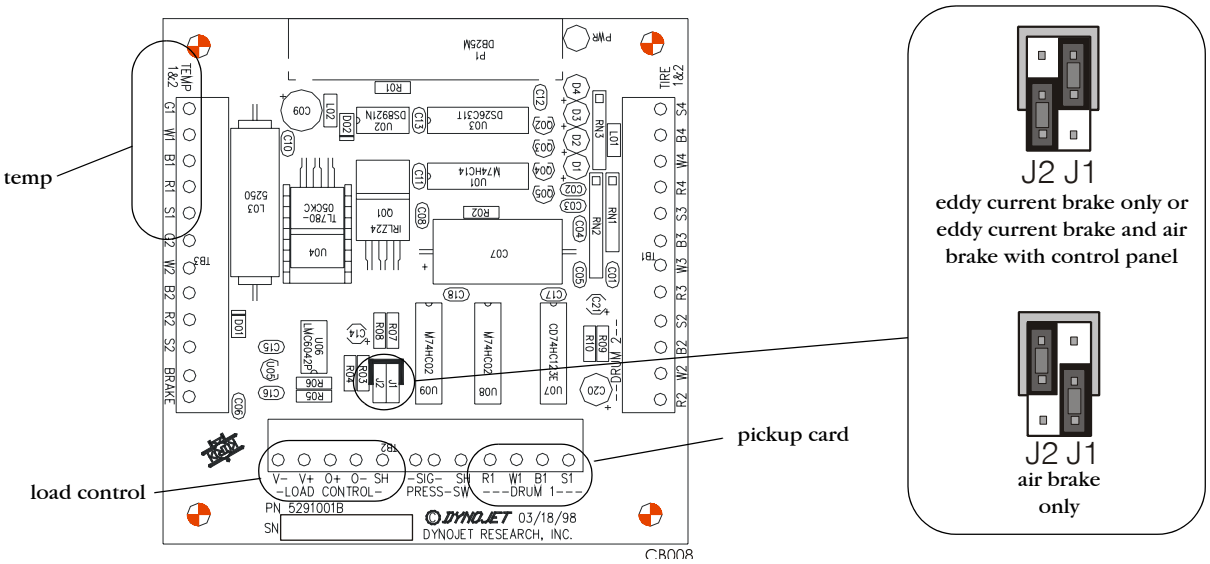


Figure 2-32: Wire the Breakout Board

ROUTING THE POWER CARRIAGE AND WHEEL CLAMP CABLES

The power carriage and wheel clamp are optional accessories. These cables will only be used if you ordered the accessories.

For installation instructions refer to “Power Carriage” on page 3-42 and “Wheel Clamp” on page 3-47 for more information.

1 Remove the two screws securing the cable pass through cover on the front of the dyno and set aside.

2 Locate the cables bundled inside the dyno.

3 Route the power carriage and wheel clamp cables through the opening in the front of the dyno.

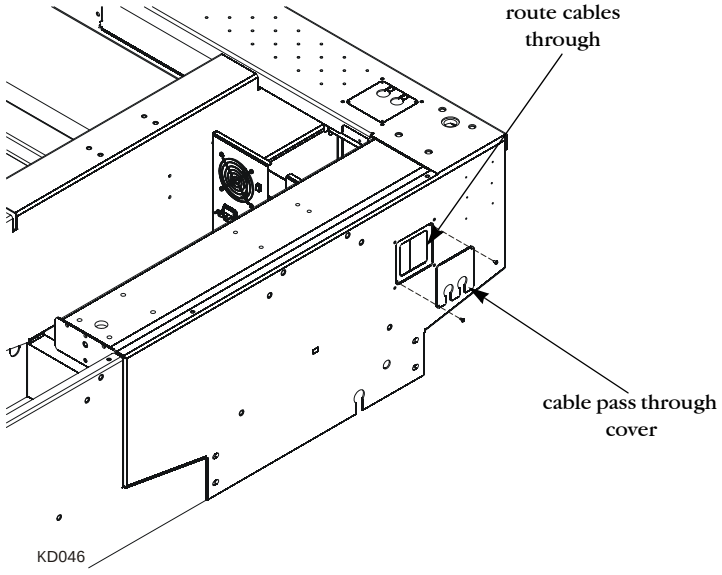


Figure 2-33: Remove the Cable Pass Through Cover

4 Place a split snap bushing around the wheel clamp cable and secure into place in one hole on the cable pass through cover.

5 Place a split snap bushing around the power carriage cable and secure into place in the other hole on the cable pass through cover.

6 Secure the cable pass through cover to the dyno with the two screws removed earlier.

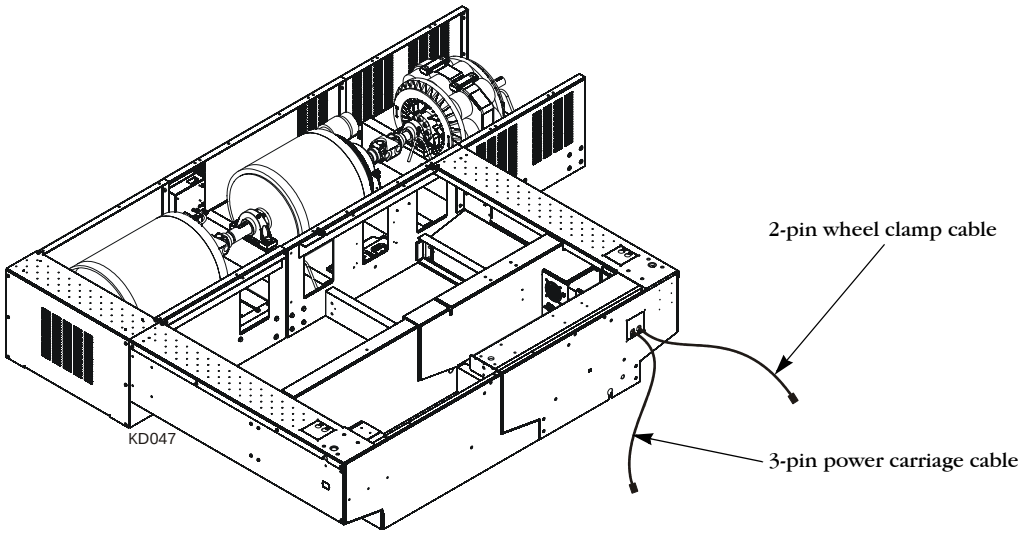


Figure 2-34: Routing Wheel Clamp and Power Carriage Cables

SIDE AND TOP COVER INSTALLATION

Before replacing the center panel install the air hose, the EEC Kit, the door safety switch, and any additional accessories you may have ordered. Refer to the appropriate sections of this manual for installation instructions.

1 Secure the eddy current brake side cover to the eddy current brake using the eight 1/4-20 x 5/8-inch screws removed earlier.

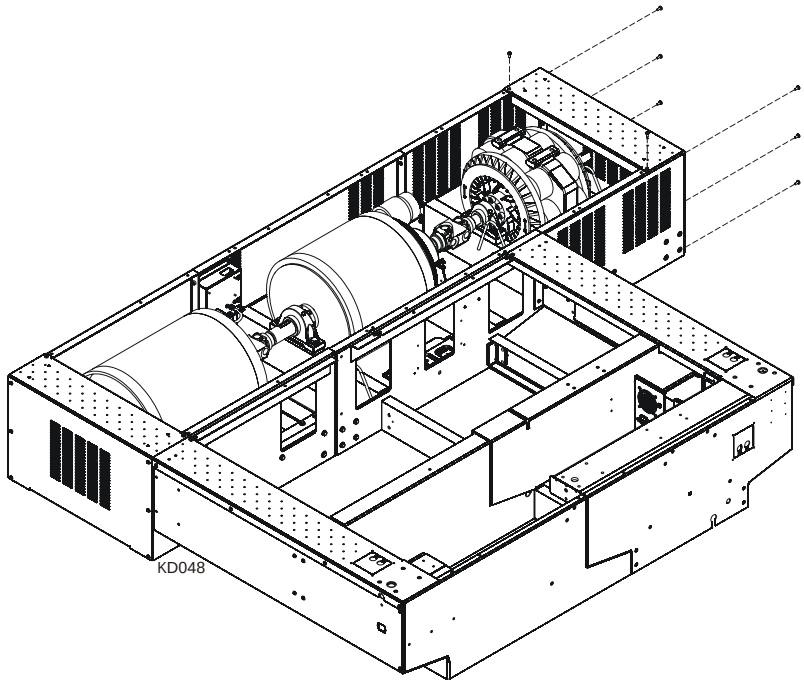


Figure 2-35: Secure the Eddy Current Brake Side Cover

2 Secure the eddy current brake top cover to the eddy current brake six 1/4-20 x 5/8-inch screws removed earlier.

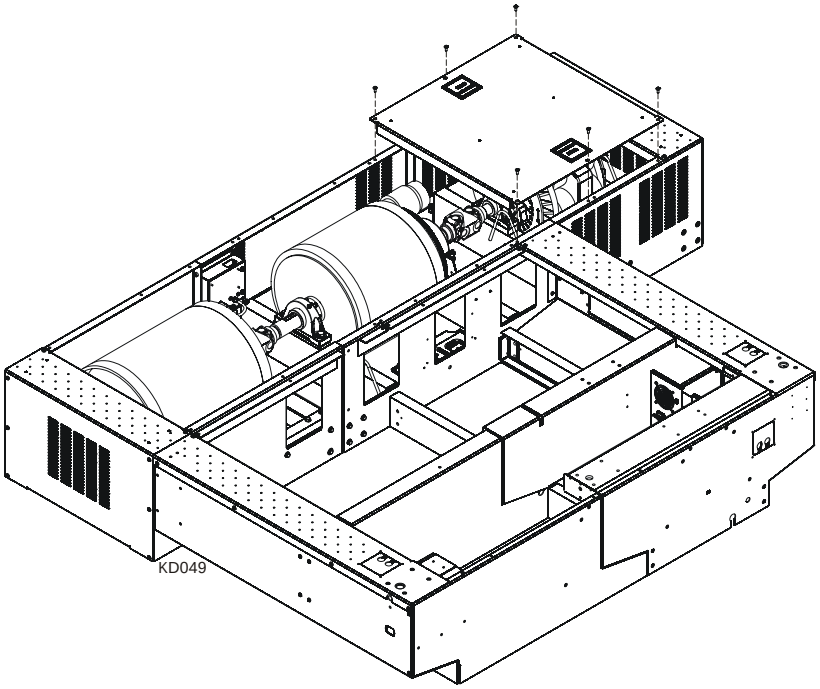


Figure 2-36: Secure the Eddy Current Brake Top Cover

3 Secure the drum top cover to the drum using the eight 1/4-20 x 5/8-inch screws removed earlier.

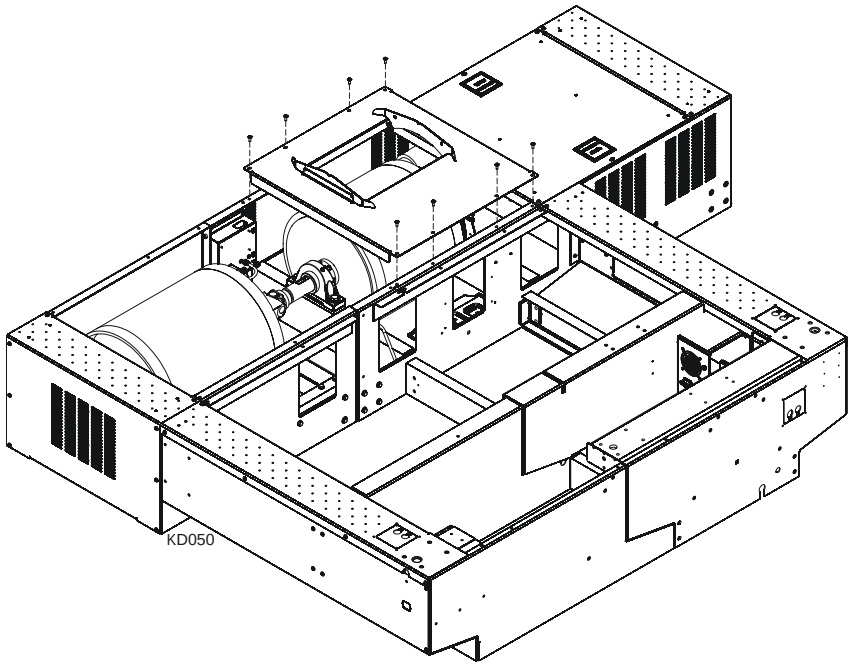


Figure 2-37: Secure the Dyno Drum Top Cover

4 Secure the center cover to the dyno using the six 1/4-20 x 5/8-inch screws removed earlier.

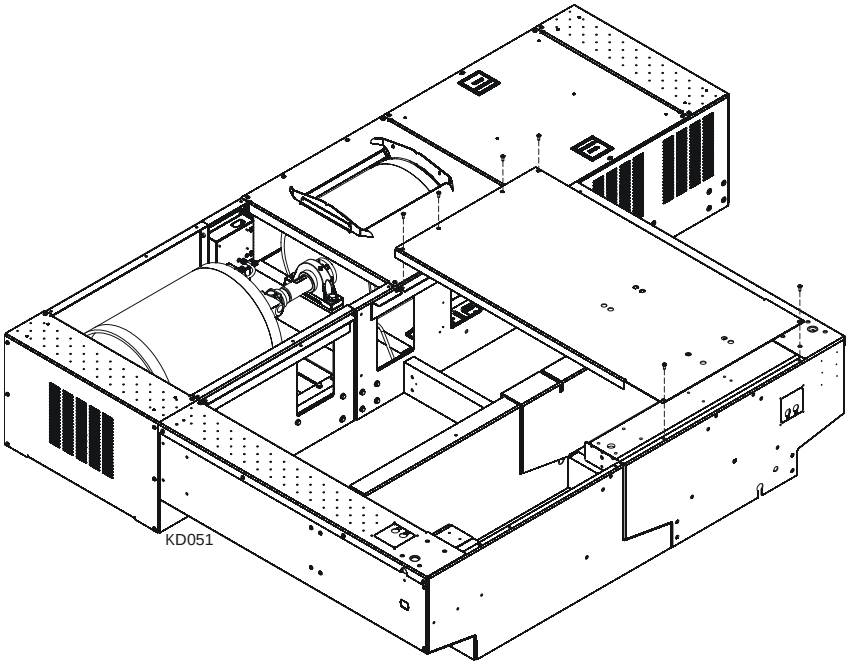


Figure 2-38: Secure the Dyno Top Center Cover

INSTALLING THE iX COVERS

You will need the following parts:

- 21200037 Center Cover, iX
- 36561045 Screw, 1/4-20 x 5/8", PH, Torx (6)

1 Secure the drum top cover to the drum module using the six 1/4-20 x 5/8-inch screws removed earlier.

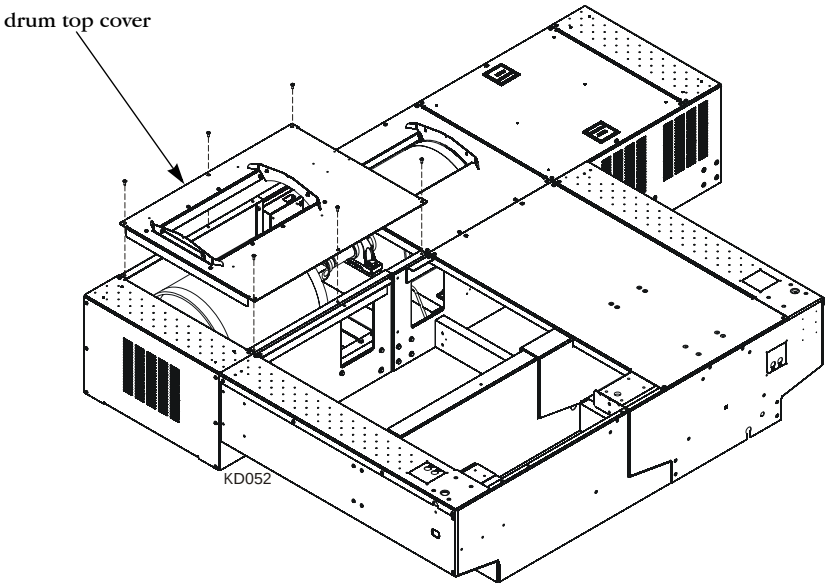


Figure 2-39: Securing the Drum Module Top Cover

2 Secure the center cover to the bulkheads using six 1/4-20 x 5/8-inch screws.

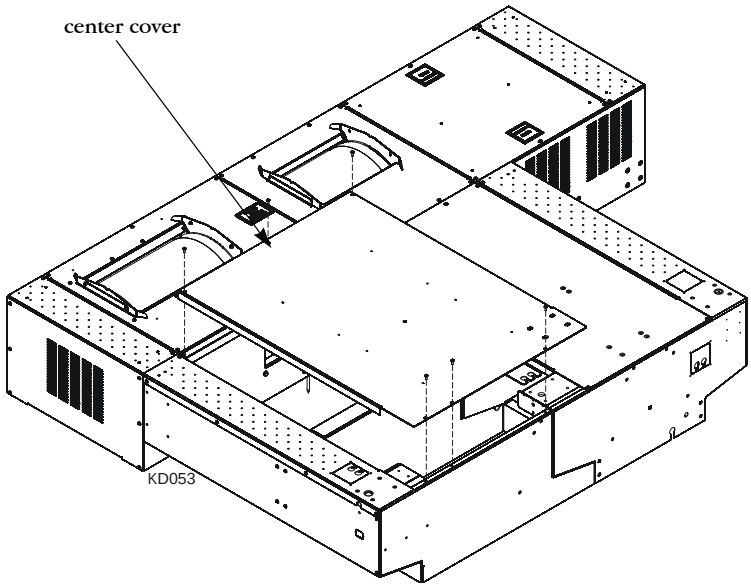


Figure 2-40: Securing the Center Cover

3 Place the drum safety cover over the drum. This cover has two pins to keep it in place.

WARNING

Risk of injury. Never run a motorcycle on the dyno without this cover in place.

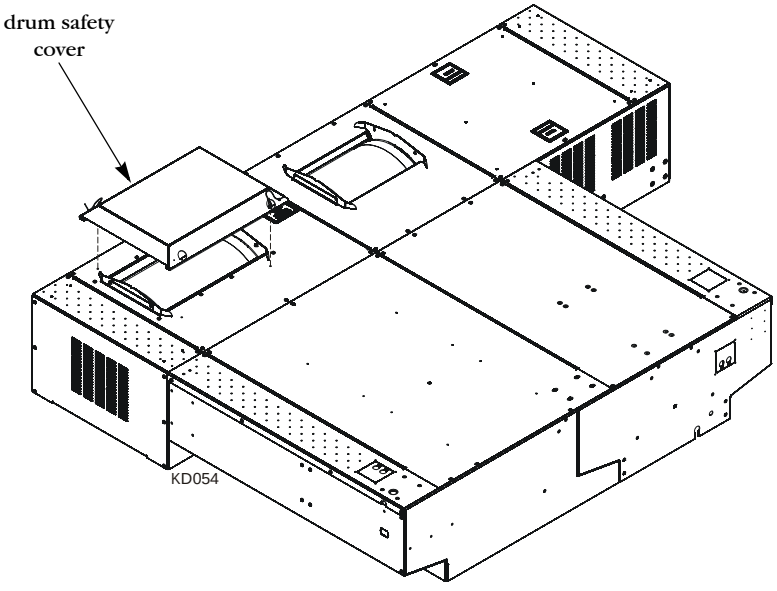


Figure 2-41: Installing the Drum Safety Cover

TRIKE CARRIAGE ADAPTER AND CARRIAGE ASSEMBLY

You will need the following parts:

- 15331100 Chain Lube
- 36500008 Capscrew, 5/16-UNC x 1", Button-head (6)
- 36500009 Capscrew, 3/8-16UNC x 1", Button-head (2)
- 63310902 Tire Stop Assembly
- 71300002 Trike Carriage Adapter Assembly
- 71323002 Carriage Assembly

INSTALLING THE TRIKE CARRIAGE ADAPTER ASSEMBLY

1 Secure the trike carriage adapter assembly to the dyno using six 5/16 x 1-inch button-head bolts where the carriage assembly was installed and two 3/8 x 1-inch button-head bolts as shown in Figure 2-42.

2 Lube the tracks with the included lube or use grease.

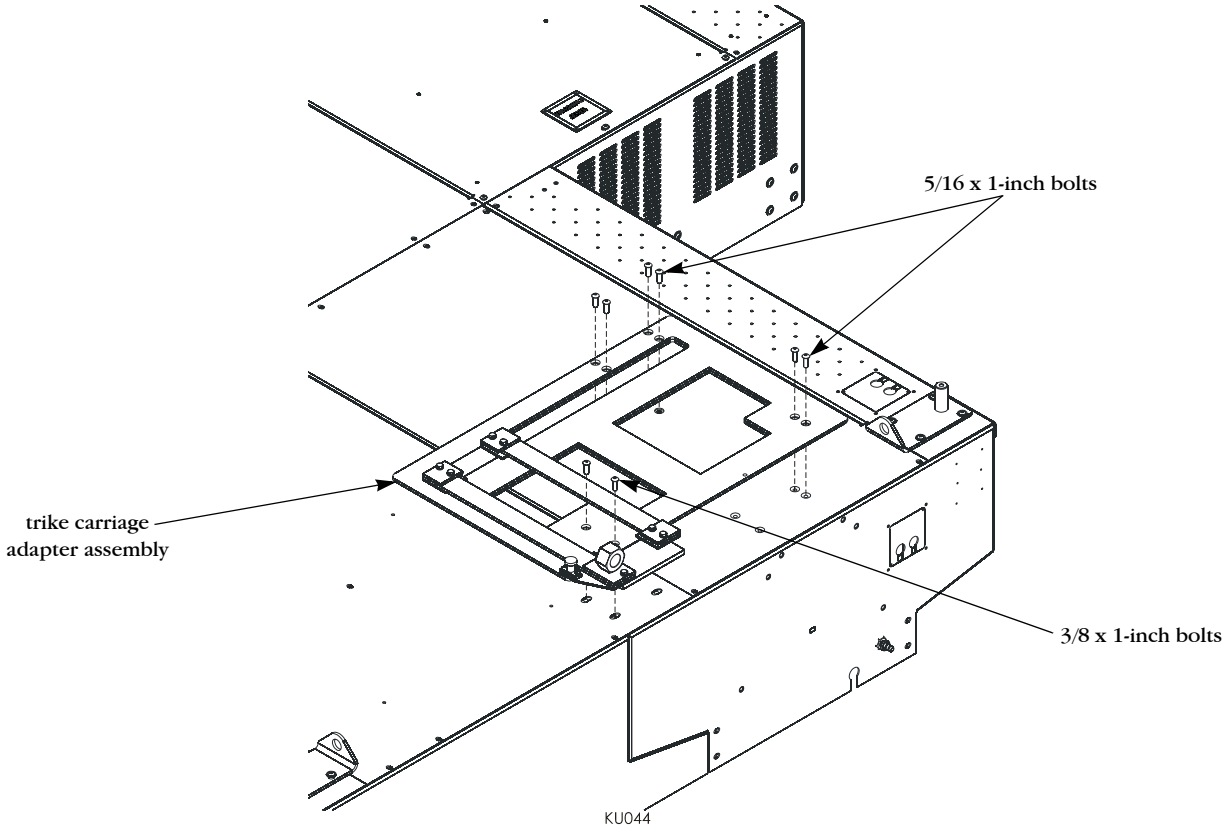


Figure 2-42: Installing the Trike Carriage Adapter Assembly

INSTALLING THE CARRIAGE ASSEMBLY

1 Remove the four 1/4 x 20-inch button-head screws securing the bearing bracket.
2 Remove the bearing bracket and the carriage screw.

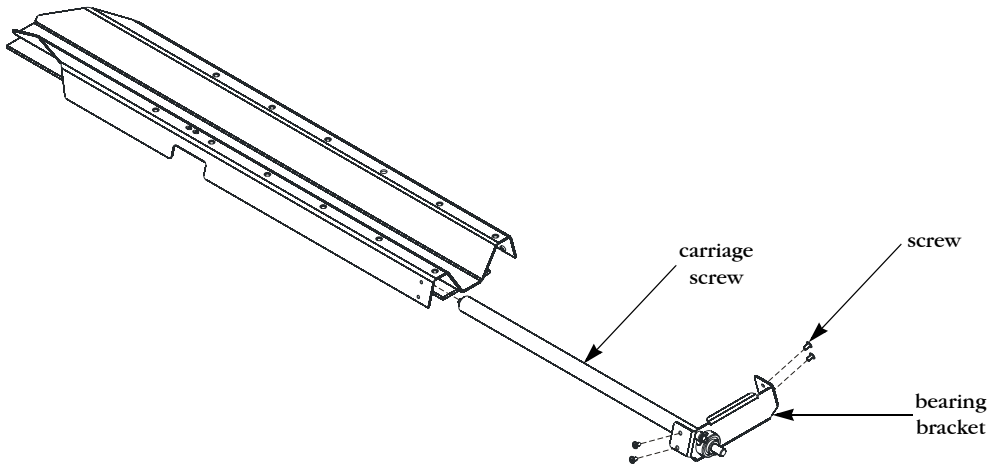


Figure 2-43: Remove the Bearing Bracket and Carriage Screw

3 Starting from the back of the dyno, slide the carriage under the carriage clamps.

4 Slide the carriage screw and the bearing bracket toward the nut block until the carriage screw is touching the nut block.

5 Slide the hand crank onto the end of the carriage screw.

6 Secure the hand crank to the screw shaft by tightening the set screw using a 5/32-inch allen wrench.

7 Using the hand crank, or the control panel to run the power carriage, run the carriage screw through the nut block and into the screw support bracket on the carriage assembly.

8 Secure the bearing bracket to the carriage assembly using the four 1/4-20 x 1/2-inch button-head screws removed earlier.

Note: If you ordered the power carriage accessory, refer to "Power Carriage" on page 3-42 for installation instructions

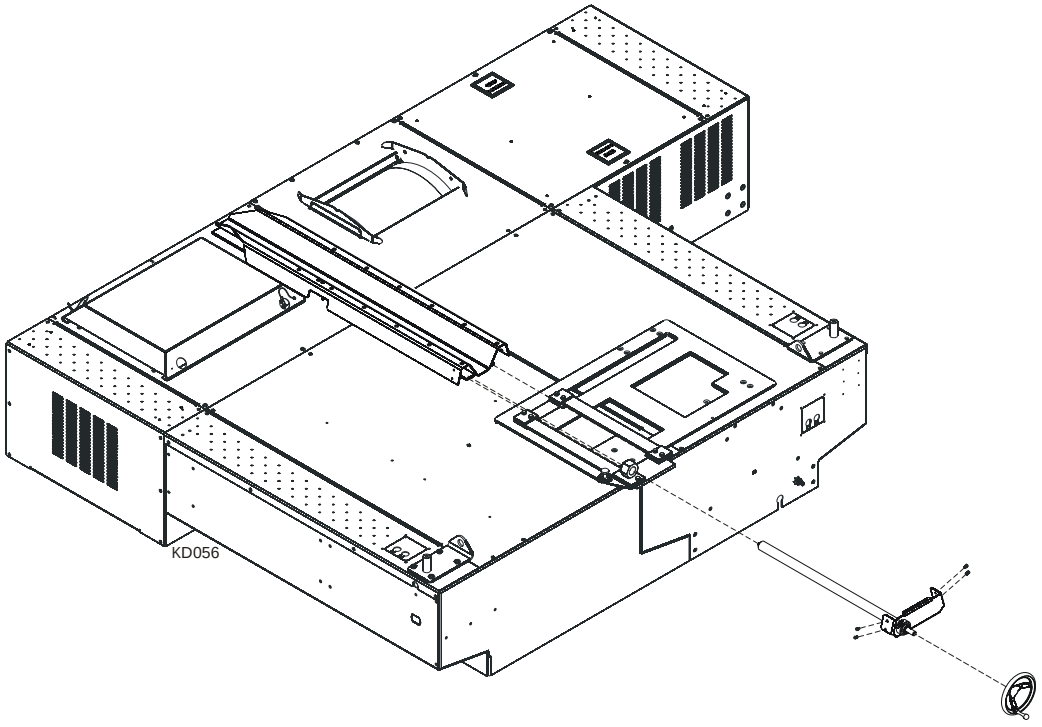


Figure 2-44: Installing the Carriage Assembly

9 Secure the tire stop to the carriage using four 3/8-16 x 1/2-inch button-head flange bolts.

10 Secure the tire lock to the carriage using four 3/8-16 x 1/2-inch button-head flange bolts.

Note: If you purchased the wheel clamp accessory, refer to "Wheel Clamp" on page 3-47 for installation instructions.

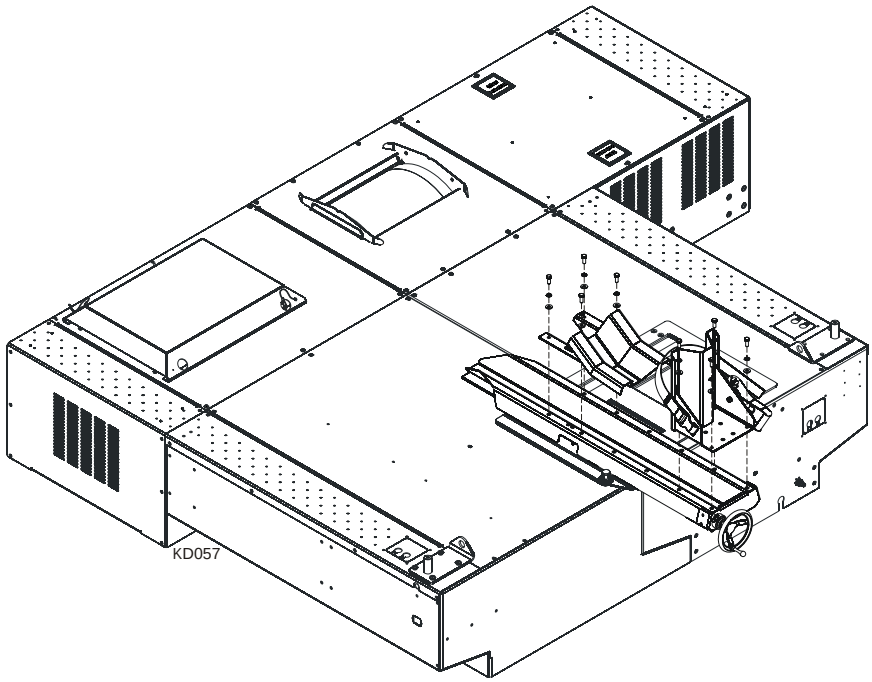


Figure 2-45: Install the Tire Lock and Tire Stop

TIE-DOWN INSTALLATION

You will need the following parts:

- 36582034 Bolt, 3/8-16 x 1.25", Button-head, Flange (8)
- 61300009 Tie-Down (2)

1 Install the tie-downs on the right side of the dyno using four 3/8-16 x 1.25-inch button-head flange screws.

2 Place the tie-down on the left side of the dyno, but do not secure.

Note: Do not secure the tie-down used with the monitor arm until the monitor arm is in place. Refer to step 1 on page 2-52 for more information.

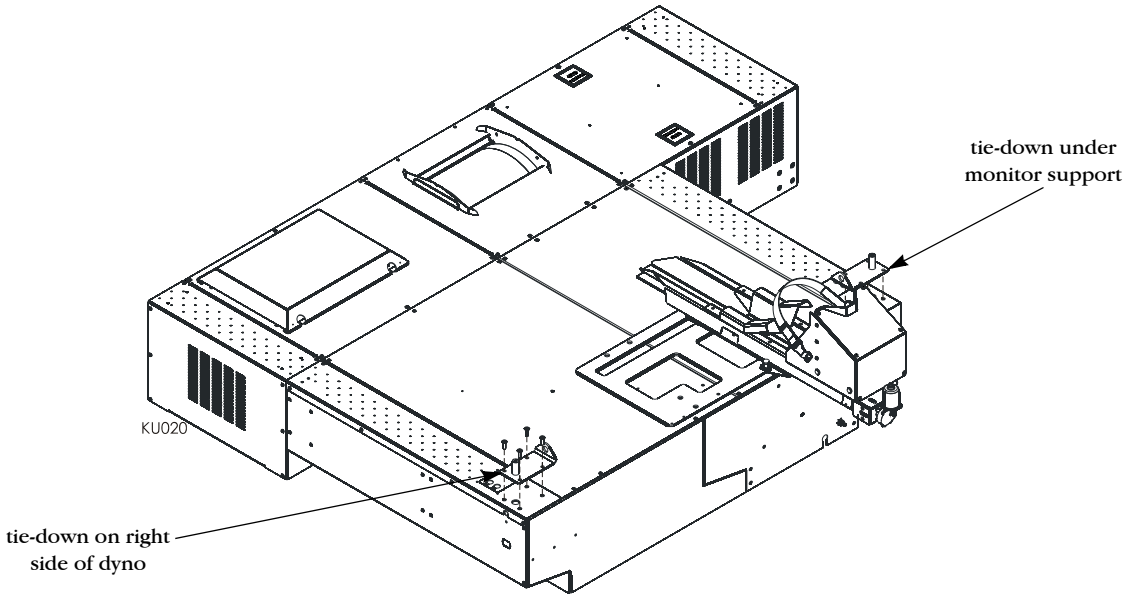


Figure 2-46: Installing the Tie-Downs

MONITOR SUPPORT, TRAY, AND CONTROL PANEL

You will need the following parts:

- 26215520 Washer, 1/8", Poly, for Monitor Support (3)
- 35521420 Cap Plug, for Monitor Support (4)
- 36582034 Bolt, 3/8-16 x 1.25", Button-head, Flange (4)
- 61329000 Control Pod Spindle
- 61329100 Monitor Arm (2)
- 61329101 Monitor Tray
- 61329500 Monitor Support
- 66117001 Control Panel Assembly

1 Secure the monitor support to the dyno using four 3/8-16 x 1.25-inch button-head flange bolts.

Note: Make sure the tie-down is sandwiched in between the dyno panel and the monitor support base.

2 Place a 1/8-inch thick poly washer around the pin on the lower monitor arm.
3 Insert the pin on the lower monitor arm into the monitor support.
4 Place a 1/8-inch thick poly washer around the pin on the upper monitor arm.
5 Insert the pin on the upper monitor arm into the lower blower arm.
6 Place a 1/8-inch thick poly washer around the pin on the monitor tray.
7 Insert the pin on the monitor tray into the upper blower arm.

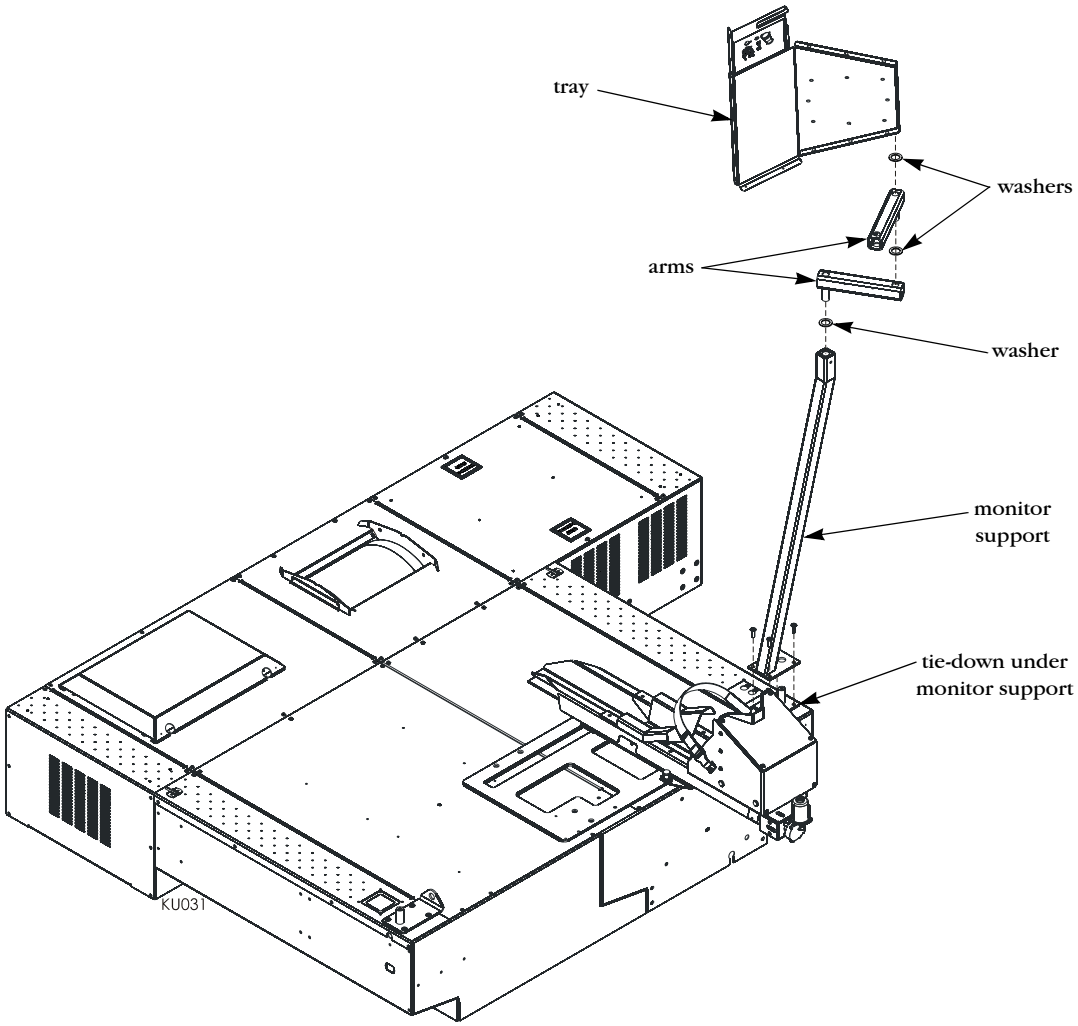


Figure 2-47: Installing the Monitor Support and Tray

8 Remove the control panel rear cover.
- 8a Remove the two nuts from the top of the cover and set aside.
- 8b Remove the screw on the top of the cover and set aside.
- 8c Remove the screw on the side of the cover and set aside.
- 8d Remove the four screws on the back of the cover and set aside.
- 8e Remove the control panel rear cover and set aside.

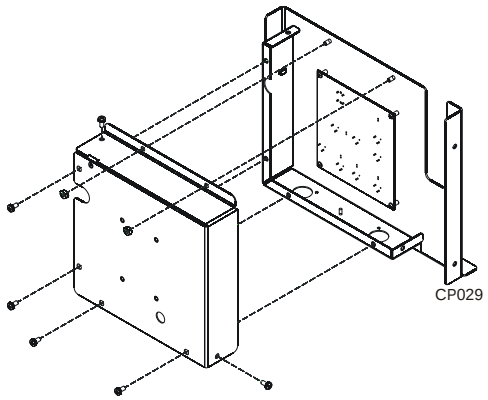


Figure 2-48: Remove the Control Panel Rear Cover

9 Route the control panel cable through the access hole on the side of the control panel box and through the cable tie.

10 Attach the control panel cable to the Button board.

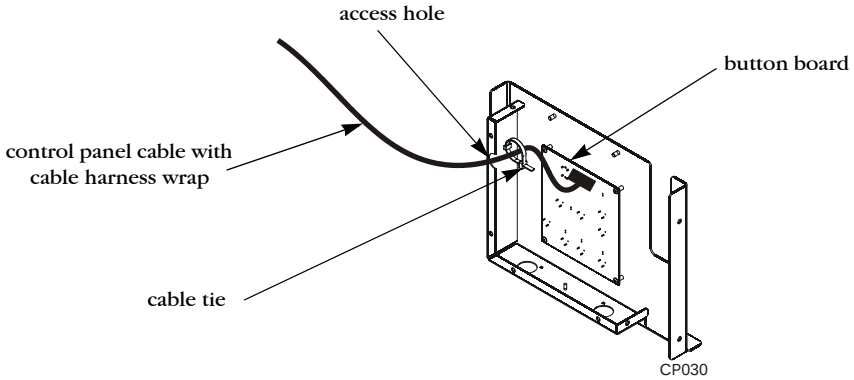


Figure 2-49: Attach the Control Panel Cable to the Button Board

11 Tighten the cable tie.

12 If you purchased the optional air brake, install the Emergency Stop Sticker at this time. Refer to page 3-5 for directions.

13 Secure the rear cover to the control panel.

13a Replace the four screws on the back of the cover removed earlier.

13b Replace the screw on the top of the cover removed earlier.

13c Replace the screw on the side of the cover removed earlier.

13d Replace the two nuts removed from the top of the cover removed earlier.

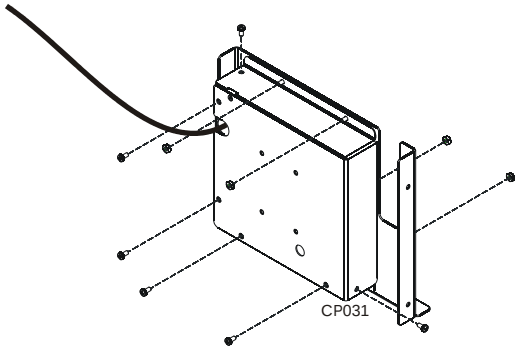


Figure 2-50: Replace the Control Panel Rear Cover

14 Secure the control panel to either side of the monitor tray using two 8-32-inch screws.

Note: If you did not order a monitor tray, you will need to install the control pod spindle on the bottom of your control panel using four 8-32 screws as shown in the detail in Figure 2-51. Once installed, place the pin on the control panel into the support arm where the monitor tray is.

15 Place the pendant in the slot on the control panel.

Note: If you plan on routing your cables through a zip tube refer to “Zip Tube” on page 2-63 and skip the following steps.

16 Route the cable bundle along the support arms with service loops to allow movement as shown below.

Note: Using the provided cable clamps and 8-32-inch screws, attach the cable bundle to the arms and the support arm. Adjust the service loops to allow for easy movement of the monitor arms without pulling on the cables.

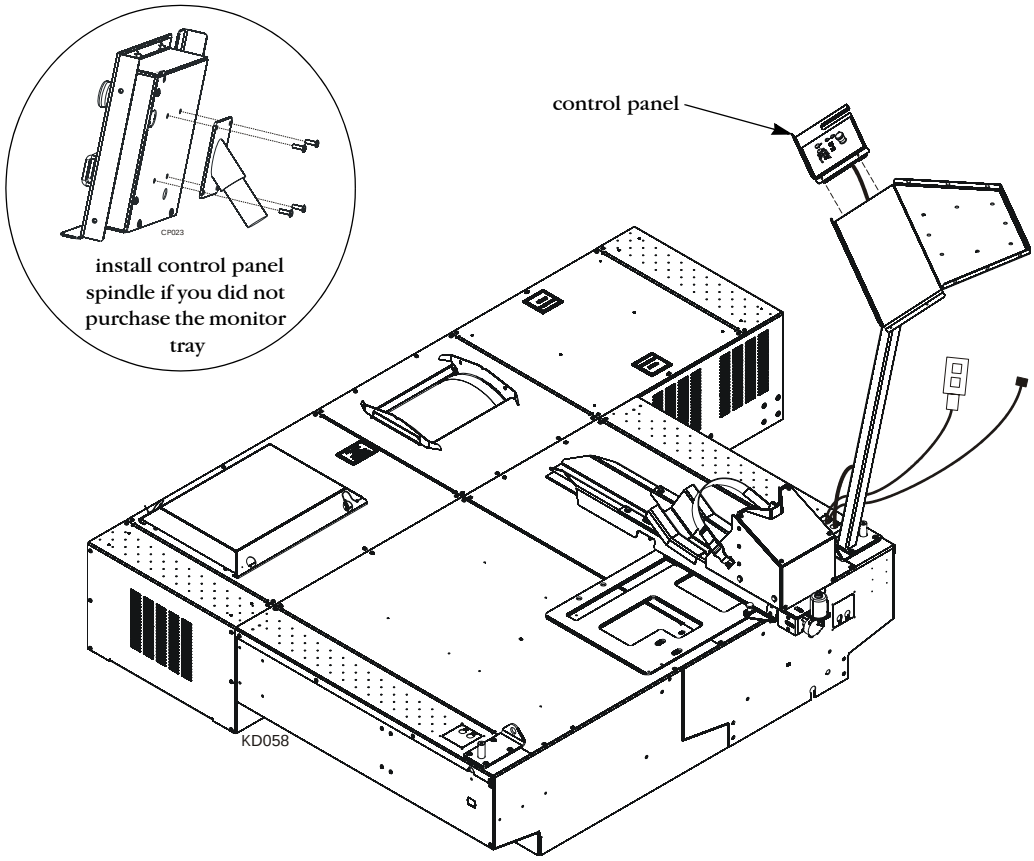


Figure 2-51: Install the Control Panel

17 Place the pendant in the slot provided on the control panel and route the cable bundle along the support arms with service loops to allow movement.

18 If you plan to route your cables through a zip tube refer to “Zip Tube” on page 2-63 and skip the following steps.

19 Attach the cable bundle with the cable clamps that are provided using 8-32-inch screws. Adjust the service loops to allow for easy movement of the monitor arms without pulling on the cables.

You may want to route the RS232 connector to your computer part way up the support arm along with the control panel and pendant cables depending on where you your computer is located.

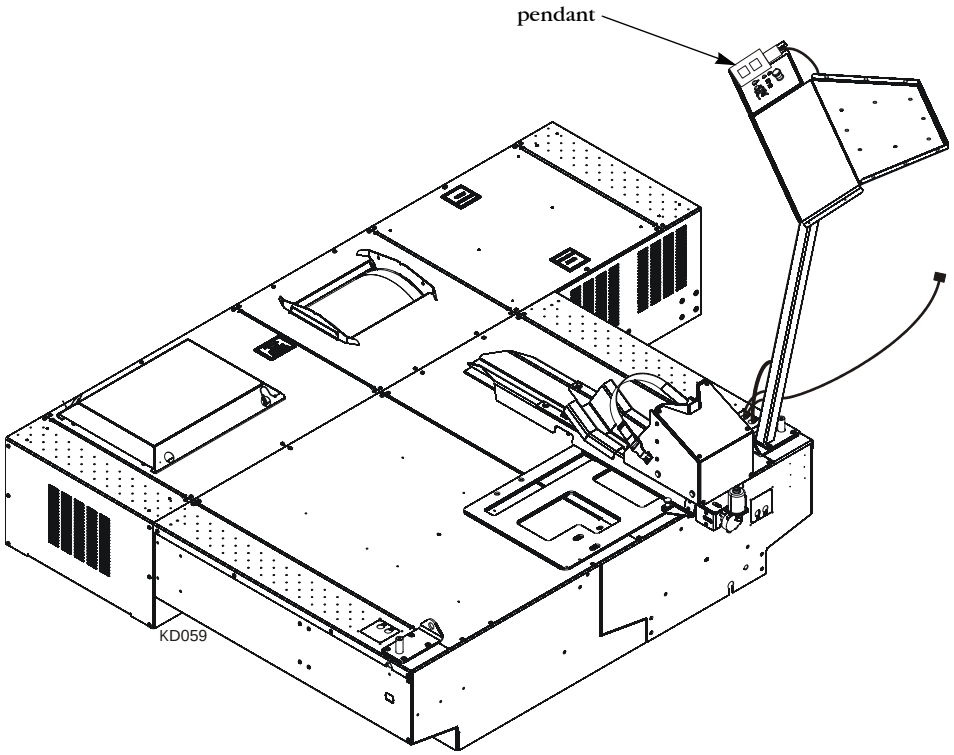


Figure 2-52: Route the Pendant Cable

HIGH PRESSURE BLOWERS

You will need the following parts:

- 21600015 Lower Blower Arm (2)
- 26215220 Washer 1.5 x .38 ID x .187 THK (2)
- 26215521 Washer 1.87 x 1.25 ID x .25 THK (2)
- 35712991 Clamp Lever, 3/8-16 x 3/4" (2)
- 76950317 Blower Extension Cord

1 Place a 1/4-inch thick poly washer around the pin on the tie-down with the monitor arm.

2 Place two 1/4-inch thick poly washers around the pin on the tie-down without the monitor arm.

3 Replace the existing lower blower arms with the new lower blower arms as shown in Figure 2-53.

4 Place the new lower blower arm over the pin.

5 Place an aluminum washer between the clamp lever and the lower bower arm.

6 Secure the lower blower arm to the tie-down pin using the clamp lever included in the upgrade.

7 Place a 1/8-inch thick poly washer around the pin on the upper blower arm.

8 Insert the pin on the upper blower arm into the lower blower arm.

9 Place a 1/8-inch thick poly washer around the pin on the blower.

10 Insert the pin on the blower into the upper blower arm.

11 Plug the power cord from the blower into the power source located on the dyno chassis.

Note: To allow full extension of the right blower, use the blower extension cord (P/N 76950317). This extension cord is only used with the blower mounted on the right side of the dyno.

CAUTION

The blowers can run at any time once the cord is plugged into a power source.

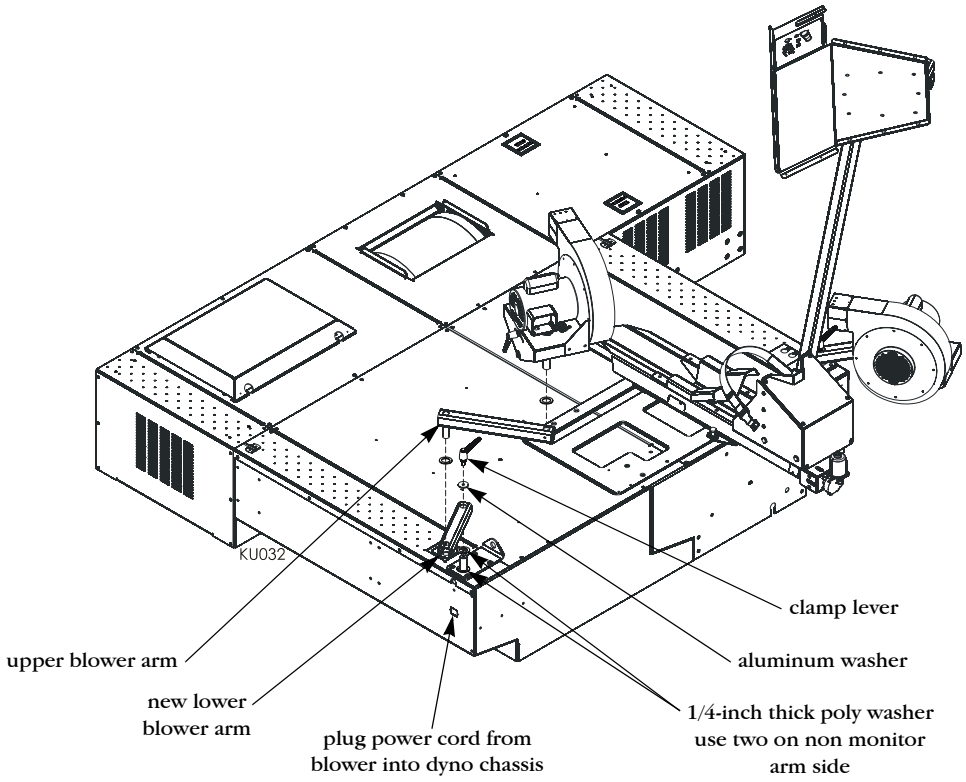


Figure 2-53: Installing the Blowers

GROUND HOOK INSTALLATION

Use the following instructions to install the ground hooks.

You will need the following parts:

- 10111 Ground Hook/D-Ring (4)
- 10112 D-Ring Bracket (4)
- 36932100 Washer, 3/8", Splitlock, Steel (8)
- 37513200 Anchor, Redhead, 3/8" (8)
- DM150-002-007 Washer, 5/16", Flat (8)
- DM150-019-012 Bolt, 3/8-16 x 1", Hex (8)

1 Mark the ground hook placement as shown in Figure 2-54. Two additional ground hooks are included for installation in front of the dyno; placement will vary depending on dyno application.

2 Using the ground hook as a template, mark and drill each hole needed to secure the ground hooks to the floor.

3 Install the Red Head anchors. Refer to Appendix A for installation instructions.

4 Secure each ground hook to the floor using two 3/8-16 x 1-inch hex bolts, two 5/16-inch flat washers, and two 3/8" lock washers.

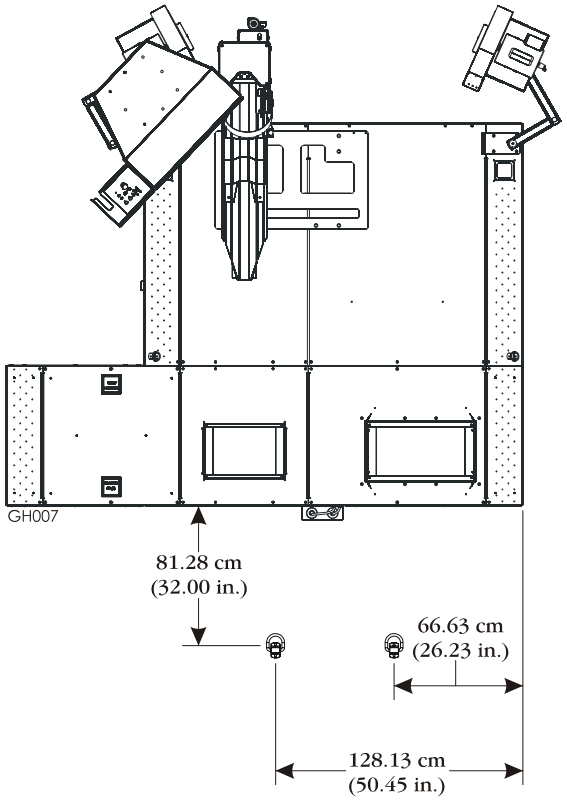


Figure 2-54: Ground Hook Placement

FINAL ADJUSTMENTS AND TESTS

After you have installed all of your additional accessories and routed all necessary cables, perform the following procedures to ensure the safe and effective operation of your dyno.

Note: Before you plug in your dyno, you or your electrician must refer to Appendix B for detailed power information.

TURNING ON THE DYNO POWER

1 Plug the power plug into the power outlet.

2 Turn on the main circuit breaker inside the CPI door.

Note: Use the main circuit breaker to turn power on and off to the dyno.

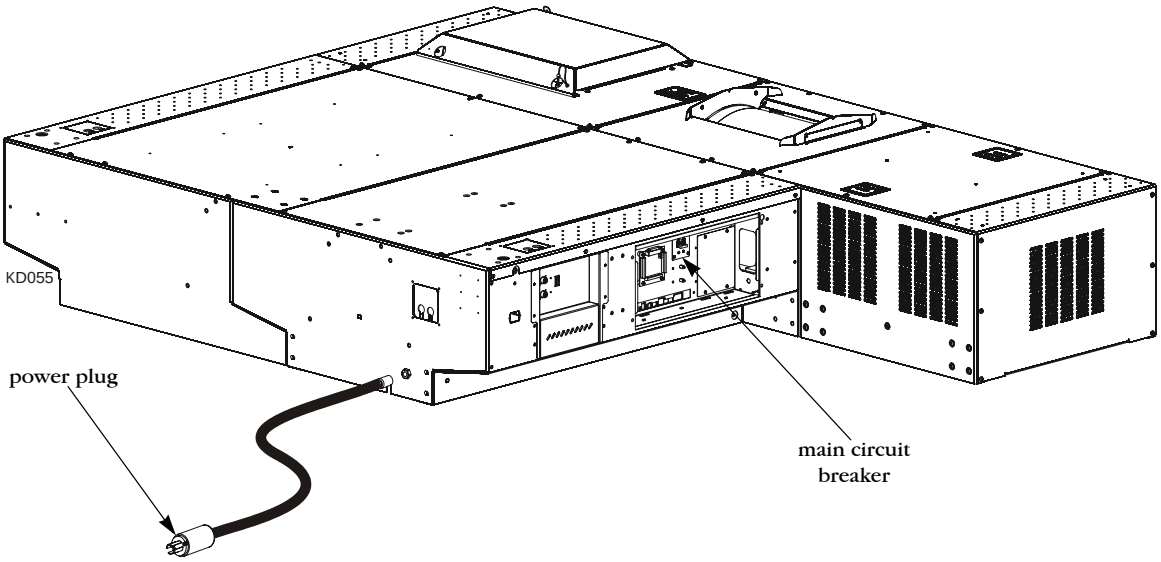


Figure 2-55: Turn on the Dyno Power

High Pressure Blower Test

Test the blowers by pressing the appropriate buttons on the control panel.

Power Carriage Final Adjustments and Tests

The power carriage is an optional accessory. To install the power carriage, refer to "Power Carriage" on page 3-20. Refer to "Using the Power Carriage" on page 4-5 for more information on using the power carriage. To route the power carriage cables, refer to "Routing the Power Carriage and Wheel Clamp Cables" on page 2-40.

Using the Control Panel, press the carriage forward and backward buttons and verify that the motor does turn.

Trike Carriage Adapter Assembly Test

1. Using the supplied chain lube or grease, lube the front and rear adapter slides (unpainted part).
2. Pull the pin up to slide the carriage until the pin locks into the next location. Verify the carriage slides left and right on the trike adapter plate.

Wheel Clamp Final Adjustments and Tests

The wheel clamp is an optional accessory. To install the wheel clamp, refer to "Wheel Clamp" on page 3-24. To route the wheel clamp cables, refer to "Routing the Power Carriage and Wheel Clamp Cables" on page 2-40.

1. Place a stack of catalogs into the wheel clamp.
2. Using the Control Panel, press the close button and observe that the wheel clamp does close. Hold the button until the motor turns off and the status light is on steady.
3. Press and hold the right hand wheel clamp button then press the left hand button to open the clamp.

   Refer to "Using the Wheel Clamp" on page 4-6 for more information on using the Control Panel.

ZIP TUBE

The zip tube encases the multiple cables running to the control panel. You will need to use the cable wrap tool (P/N 16510001) to insert the cables into the zip tube.

1 Rotate the cable holder to the open position.

2 Insert the cable(s) into the cable holder.

- Pendant Cable
- Control Panel Cable
- RPM cable(s)
- Additional cables, if desired

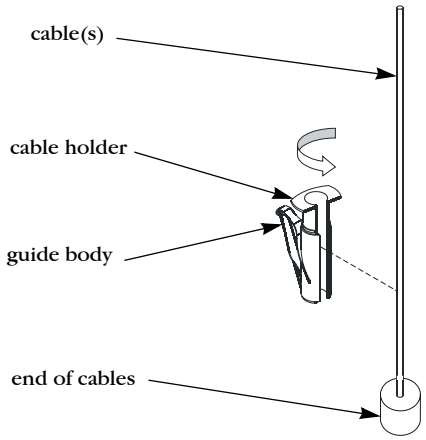


Figure 2-56: Insert the Cable(s) Into the Cable Holder

3 Rotate the cable holder closed.

4 Insert the guide body into the zip tube.

Note: Make sure you start the cable wrap tool close to the end of the cables. This will make it easier to pull the tool along the length of the cables.

5 Pull the cable wrap tool through the zip tube along the length of the cables.

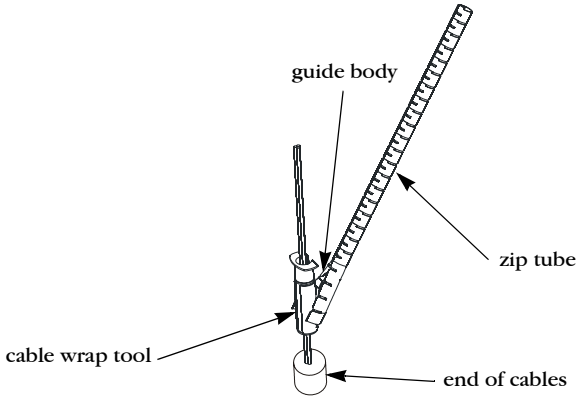


Figure 2-57: Secure the Cable(s) Into the Zip Tube

CHAPTER

3

ACCESSORIES

This chapter discusses the various optional accessories that are available for the Dynojet Motorcycle Dynamometer (dyno) to meet your individual needs. All of these options can be added at the factory at the time of original dyno purchase, or purchased separately and added at any time thereafter. For more information about these accessories, please contact Dynojet's Product Specialists at 1-800-992-3525 for pricing and availability.

Installation instructions for some of these options can be found in this chapter. Complete installation instruction manuals may also be found by browsing the Manuals folder on your WinPEP installation CD.

This chapter is divided into the following categories:

- Main Dyno Power, page 3-2
- Air Brake, page 3-3
- Compressed Air Pump Assembly, page 3-16
- Extended Carriage, page 3-17
- Power Carriage, page 3-20
- Wheel Clamp, page 3-24
- Final Adjustments and Tests, page 3-28

MAIN DYNO POWER

Many instructions in this guide will require you to connect or disconnect the power to the dyno as part of the installation process. Use the following steps to connect and disconnect power to the dyno.

Note: Before you plug in your dyno, you or your electrician must refer to Appendix B for detailed power instructions.

Always turn the power off when connecting and disconnecting cables.

1 Use the main circuit breaker to turn power on and off to the dyno.

The main circuit breaker is located inside the CPI door. When the handle is in the down position all power into the dyno is turned off.

2 Disconnect the power plug to ensure all power has been removed from the dyno before performing certain installation procedures.

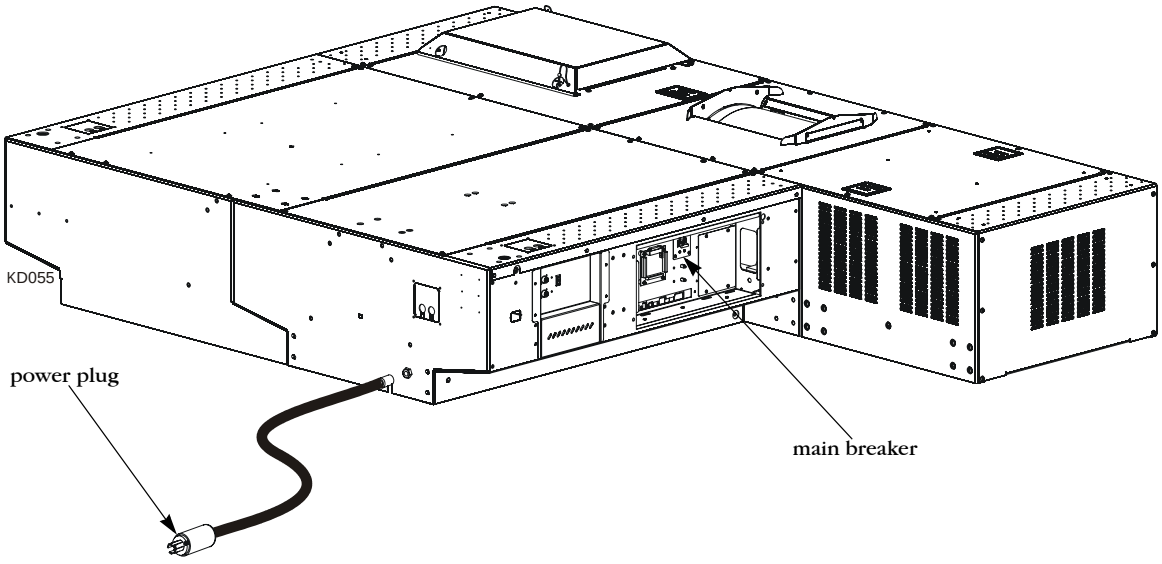


Figure 3-1: Main Dyno Power

AIR BRAKE

The optional air brake (P/N 63920005) comes installed and ready to use. You will need to provide an air hose nipple (1/4-inch NPT) to connect your clean, dry shop air supply (60 psi, 415 kilopascal, max constant line pressure) to the dynamometer. Once air pressure is connected and the air brake cable is routed, the air brake is ready to use.

Note: For information on installing the air brake, refer to the Air Brake and EEC Kit Installation Guide for Model 200i/250i and 200iP/250iP Motorcycle Dynamometer, P/N 98123114.

ROUTING THE AIR BRAKE CABLE AND AIR HOSE

1 Open the CPI front panel to access the breakers and Breakout board.

2 Route the air brake cable from the air brake solenoid to the CPI.

Note: The CPI end of the air brake cable splits in two.

3 Connect the cable with the two black wires to the Breakout board wiring block labeled Brake.

4 Attach the 4-pin connector to port P7 on the CPI board.

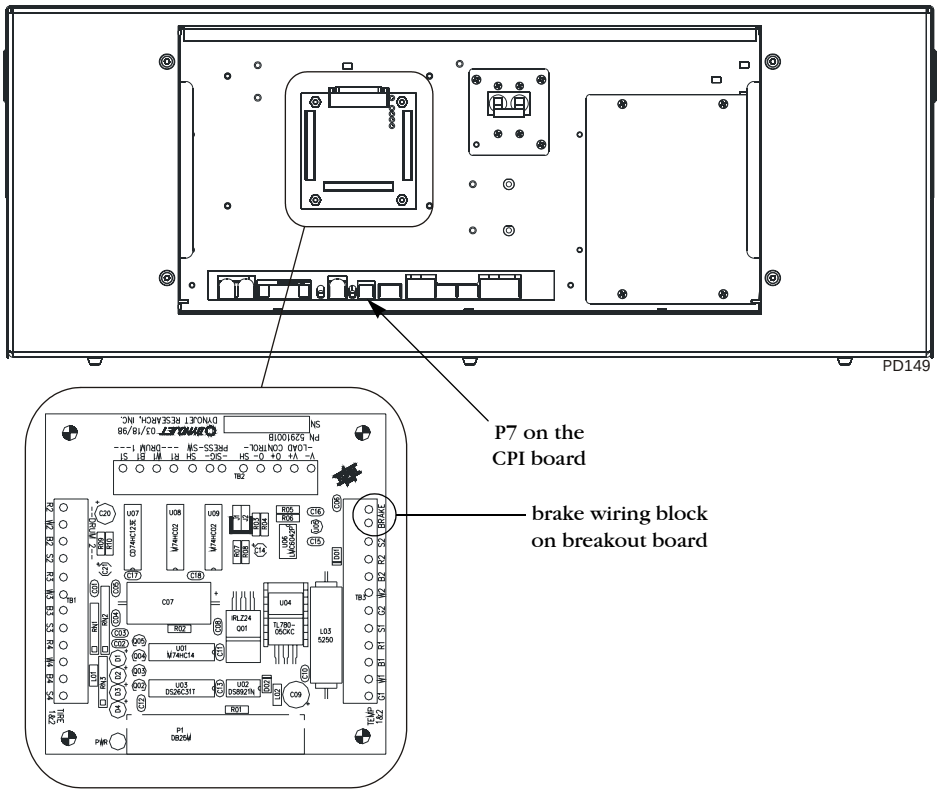


Figure 3-2: Route the Air Brake Cable

5 Route the air hose from the air brake through the access hole in the drum module upright, under the carriage frame brace, and connect to the bulkhead fitting at the front of the dyno.

6 You will need to provide an air hose nipple (1/4-inch NPT) to connect your clean, dry shop air supply (60 psi, 415 kilopascal, max constant line pressure) to the dynamometer.

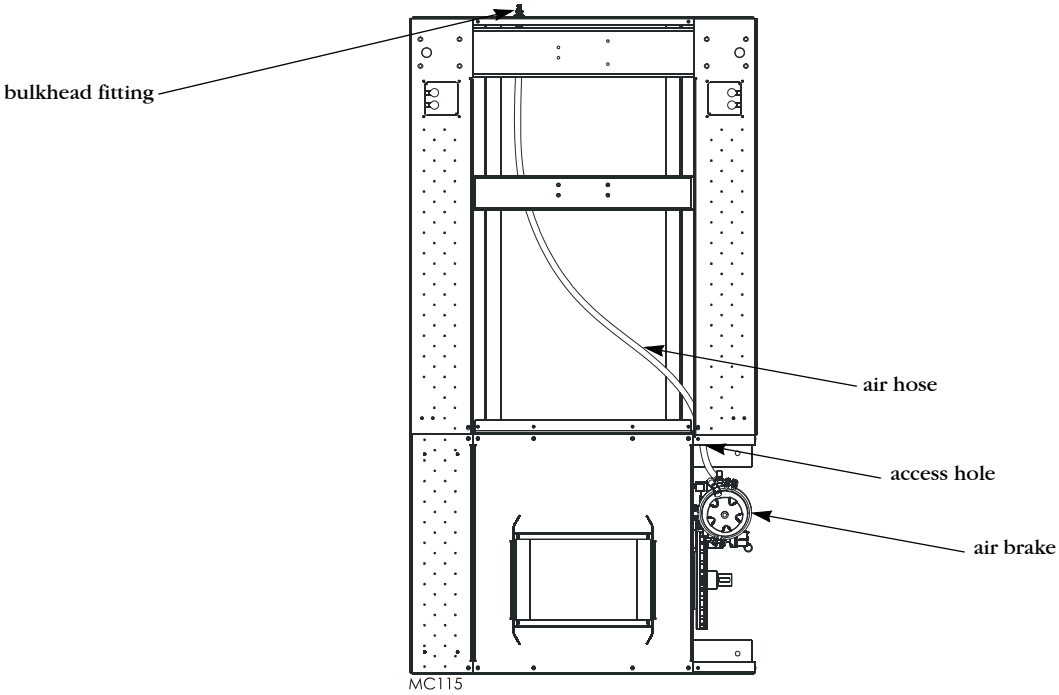


Figure 3-3: Connect the Air Hose

INSTALLING THE EMERGENCY STOP STICKER

A properly installed air brake option adds an emergency stop function to the dyno shutdown button. With the air brake installed, activating the dyno shutdown button applies the brake and stops the drum. Installing the emergency stop sticker indicates the added functionality applied to the dyno shutdown button.

1 Remove the control panel rear cover.
   1a Remove the two nuts from the top of the cover and set aside.
   1b Remove the screw on the top of the cover and set aside.
   1c Remove the screw on the side of the cover and set aside.
   1d Remove the four screws on the back of the cover and set aside.
   1e Remove the control panel rear cover and set aside.

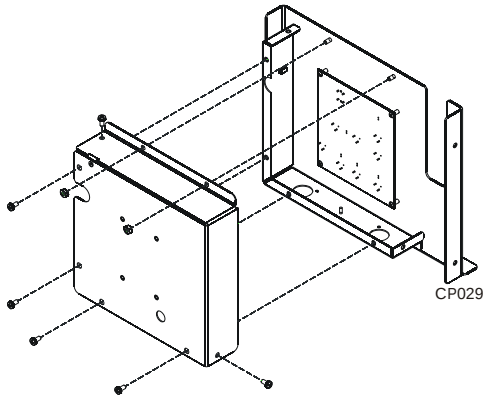


Figure 3-4: Remove the Control Panel Rear Cover

2 Remove the Button board.
   2a Remove the four screws securing the Button board to the control panel and set aside.
   2b Remove the Button board and set aside.

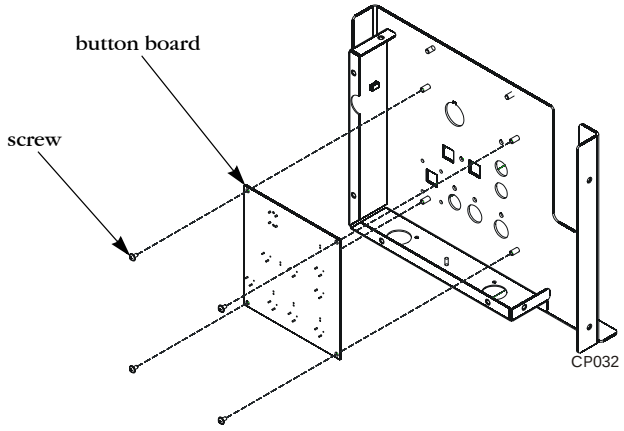


Figure 3-5: Removing the Button Board

3 Unscrew the black switch body nut and remove the switch body. Set the nut and switch body aside.

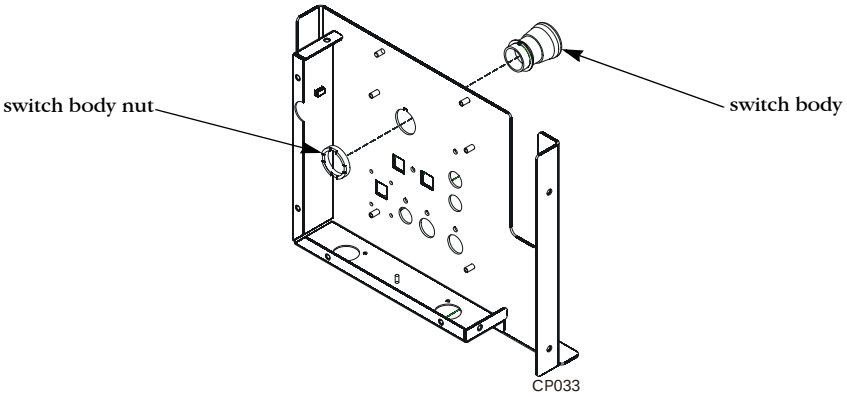


Figure 3-6: Removing the Switch Body

4 Place the emergency stop sticker over the dyno shutdown sticker.

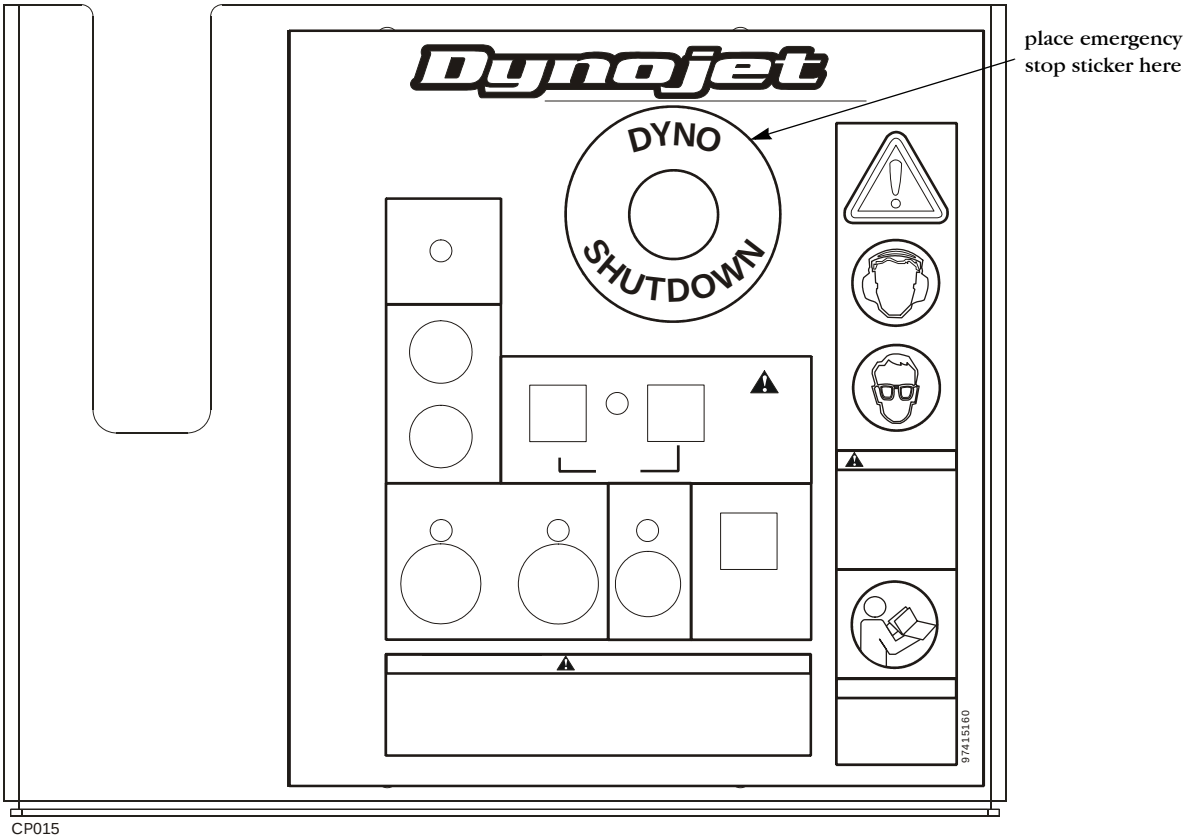


Figure 3-7: Placing the Emergency Stop Sticker

5 Secure the switch body to the control panel using the switch body nut removed earlier.

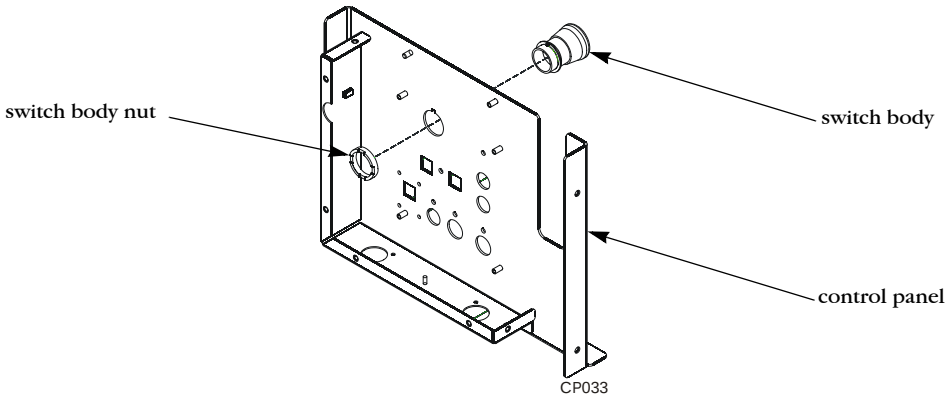


Figure 3-8: Replacing the Emergency Stop Button

6 Secure the Button board to the control panel using the four screws removed earlier.

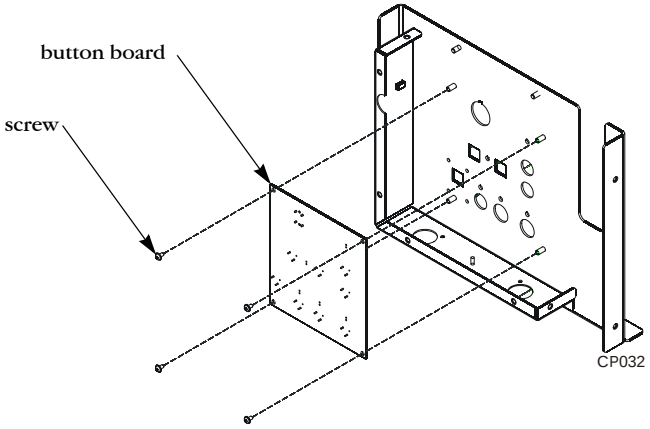


Figure 3-9: Securing the Button Board

7 Secure the rear cover to the control panel.
   7a Replace the four screws on the back of the cover removed earlier.
   7b Replace the screw on the top of the cover removed earlier.
   7c Replace the screw on the side of the cover removed earlier.
   7d Replace the two nuts removed from the top of the cover removed earlier.

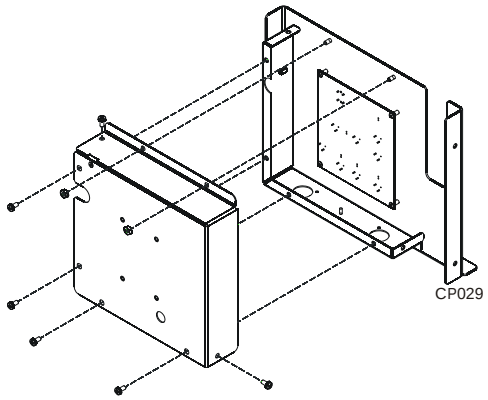


Figure 3-10: Replace the Control Panel Rear Cover

Air Brake Final Adjustments and Tests

1 Verify the dyno is set up properly, the dyno electronics is powered up and operational, and the air supply is connected properly.
2 Use the red brake button on the pendant or the emergency stop button on the control panel to activate and deactivate the brake. Listen for air leaks and double check all connections.
3 Verify the brake pads release far enough so they do not touch the rotor. There should be equal pad clearance on both sides of the rotor. If the pads touch the rotor during a run, the information provided by the dyno will be inaccurate.

   Refer to page 3-15 for instructions on adjusting the brake pad clearance.

CHANGING THE BRAKE PADS

You will need the following part:

- 78122005 Brake Pad Kit

WARNING

To prevent possible injury, open the CPI door and set the main breaker to the off position and unplug the dyno. Refer to Figure 3-1 for breaker location.

1 Remove the top and right side covers from the dyno.
2 For safety, apply the brake and disconnect the air supply at the front of the dyno.
3 Remove the hairpin cotter and loosen the castle nut until the pads clear the rotor.

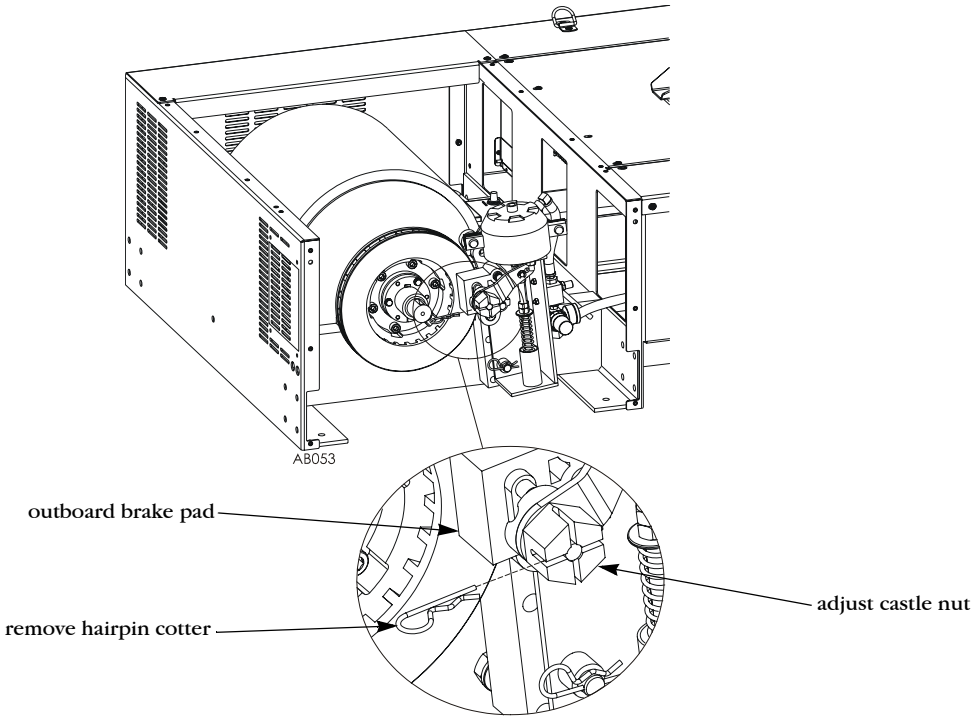


Figure 3-11: Loosen the Castle Nut

4 Using a 9/16-inch ratchet and wrench, remove the bolt, washer, and nut securing the spring to the brake assembly. The spring is located on the drum side of the brake assembly.

Note: For clarity, the drum is not shown.

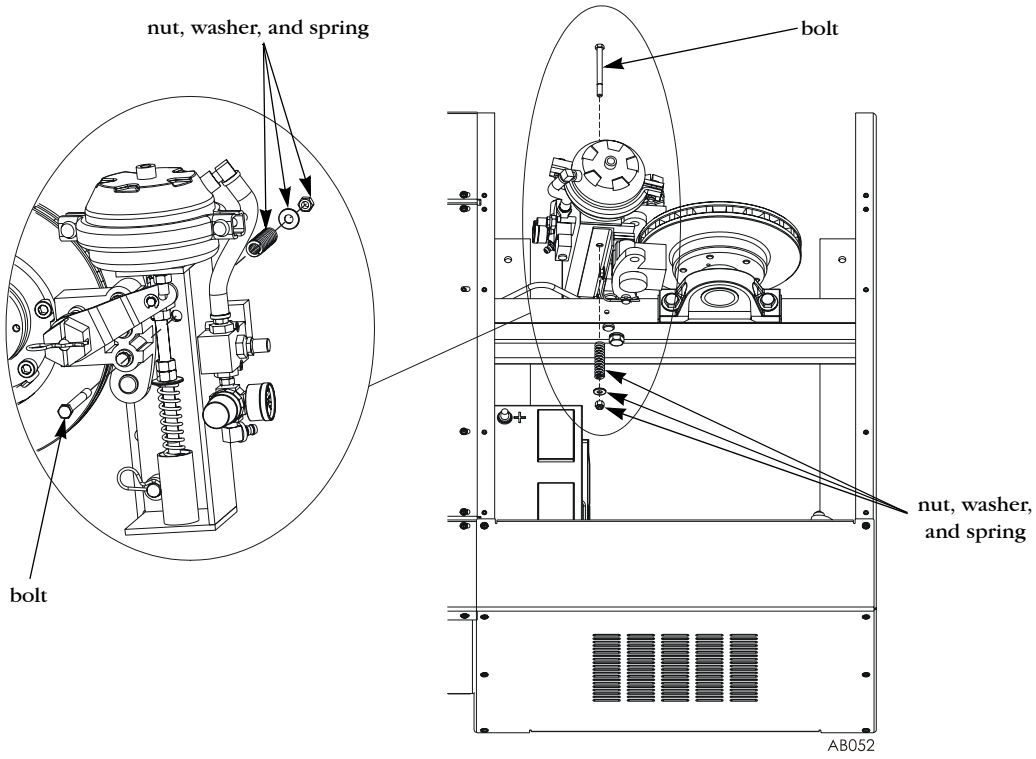


Figure 3-12: Remove the Brake Spring

5 Remove the two bolts and two washers securing the brake caliper stop to the brake bracket and remove the brake caliper stop.

Note: For clarity, the drum and parts of the dyno frame are not shown.

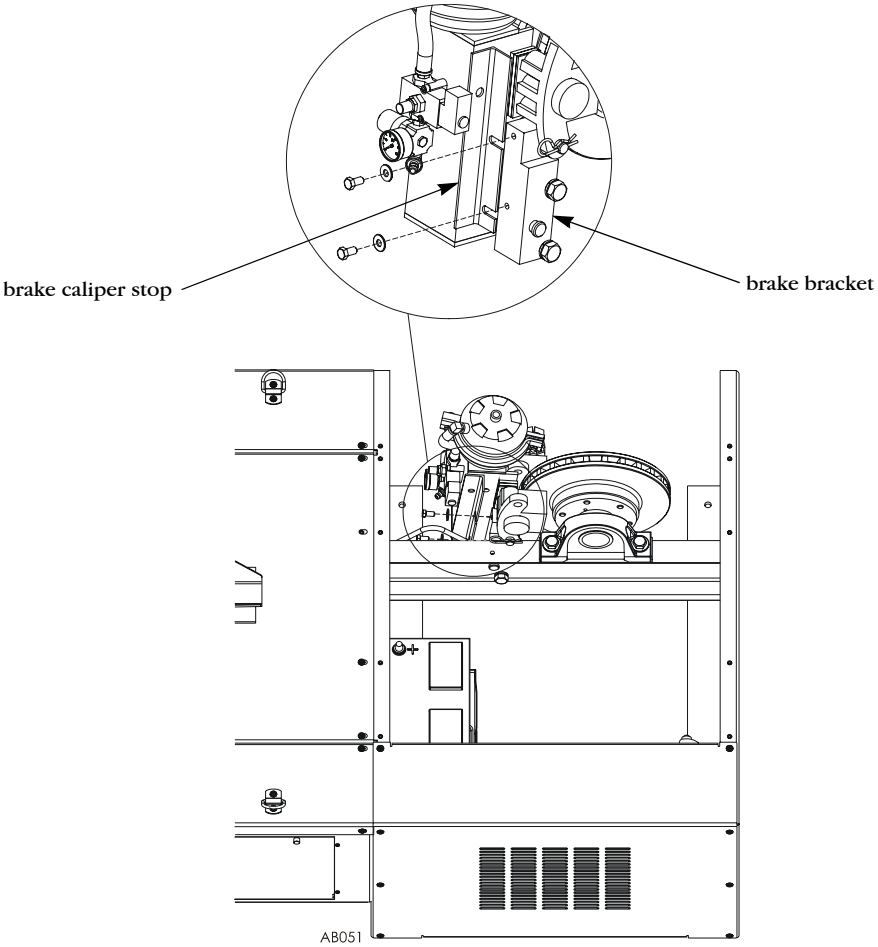


Figure 3-13: Remove the Brake Caliper Stop

6 Remove the hairpin cotter from the bottom clevis pin located on the front of the air brake assembly.

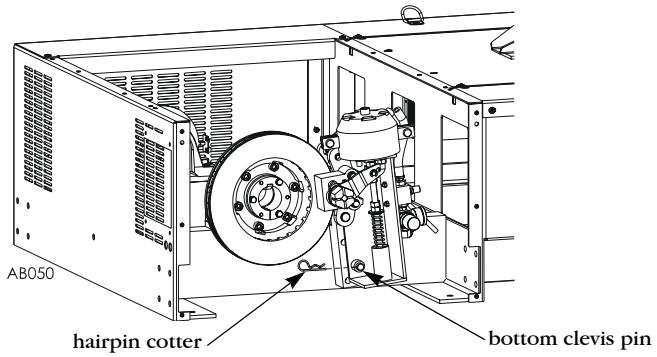


Figure 3-14: Remove the Bottom Hairpin Cotter

7 Push the bottom clevis pin towards the back of the assembly (drum side). You do not need to remove the pin completely.

8 Remove the hairpin cotter from the top clevis pin located on the drum side of the air brake assembly.

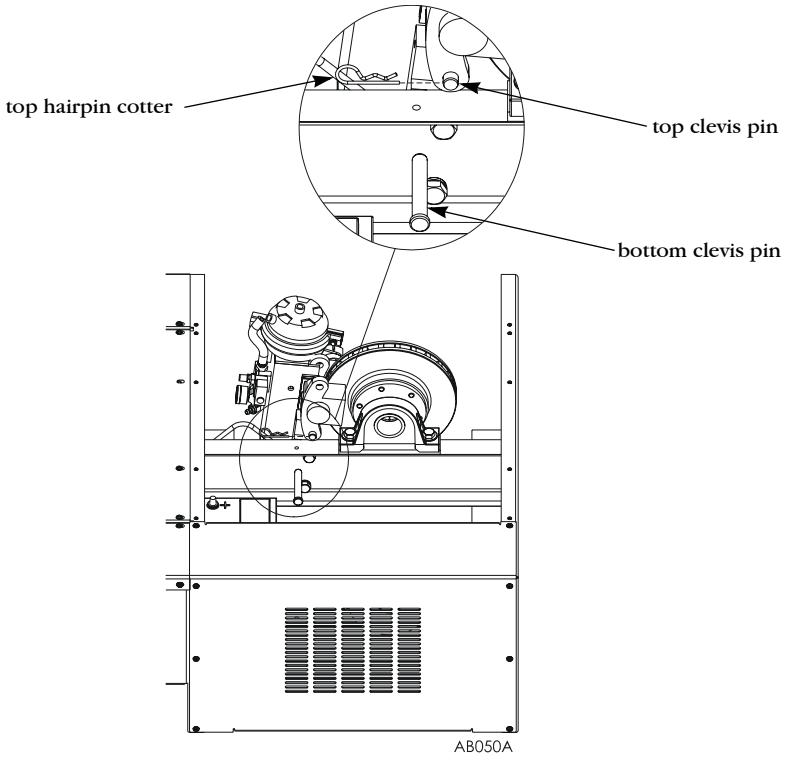


Figure 3-15: Remove the Bottom Pin and the Top Hairpin Cotter

9 Remove the top clevis pin.

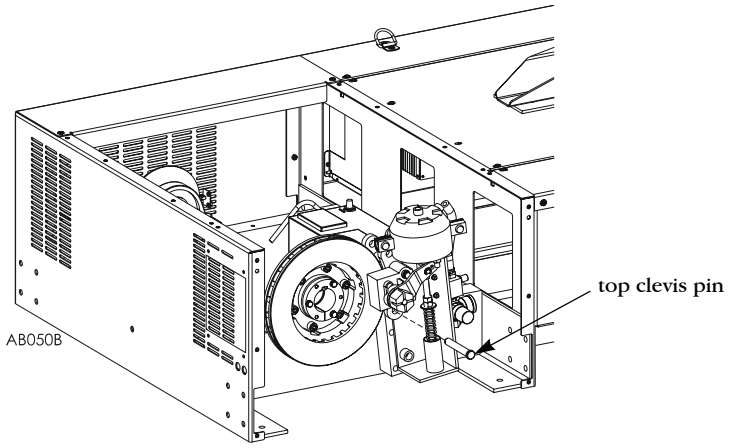


Figure 3-16: Remove the Top Clevis Pin

10 Lift the air brake assembly up and away from the dyno.

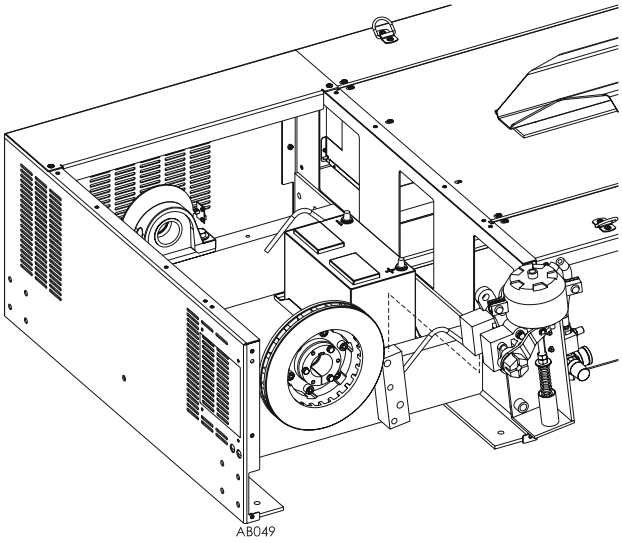


Figure 3-17: Remove the Brake Assembly

11 Remove the brake pad retaining springs and slide the pads out.

Note: You will need to use pliers to remove the spring securing the outside pad (closest to the castle nut).

12 Install the new brake pads and secure the pads with new springs.

13 Place the air brake assembly back on the brake bracket. Refer to Figure 3-17.

14 Replace the top and bottom clevis pins and secure with the hairpin cotters removed earlier. Refer to Figure 3-14, Figure 3-15, and Figure 3-16.

15 Using two bolts and two washers, secure the brake caliper stop to the brake bracket. Refer to Figure 3-13.

16 Secure the spring using the bolt, washer, and nut you removed earlier. Refer to Figure 3-12.

17 Tighten the castle nut and replace the hair pin cotter. Refer to Figure 3-11.

18 Adjust the brake pad clearance. Refer to page 3-15 for complete instructions.

19 Replace the top and right side covers.

20 Connect your shop air.

ADJUSTING THE BRAKE PAD CLEARANCE

There should be equal pad clearance on both sides of the rotor. If the pads touch the rotor during a run, the information provided by the dyno will be inaccurate. Use the following steps to adjust the clearance.

1 Loosen the brake caliper stop bolts.

2 Insert the brake adjusting shim between the inboard brake pad and the brake rotor. Refer to Figure 3-18.

3 Remove the hairpin cotter and hand tighten the castle nut on the caliper assembly to clamp the brake pads against the rotor and shim. Refer to Figure 3-11 for hairpin and castle nut location.

4 Tighten the brake caliper stop bolts.

5 Loosen the castle nut and remove the shim.

6 Adjust the clearance between the outboard brake pad and rotor. Loosen the castle nut to increase the clearance.

There should be equal space on both sides of the rotor.

7 Replace the hair pin cotter in the castle nut.

Note: Cycle the brake to verify the brake pads release far enough so they do not touch the rotor. If the pads touch the rotor during a run, the information provided by the dyno will be inaccurate.

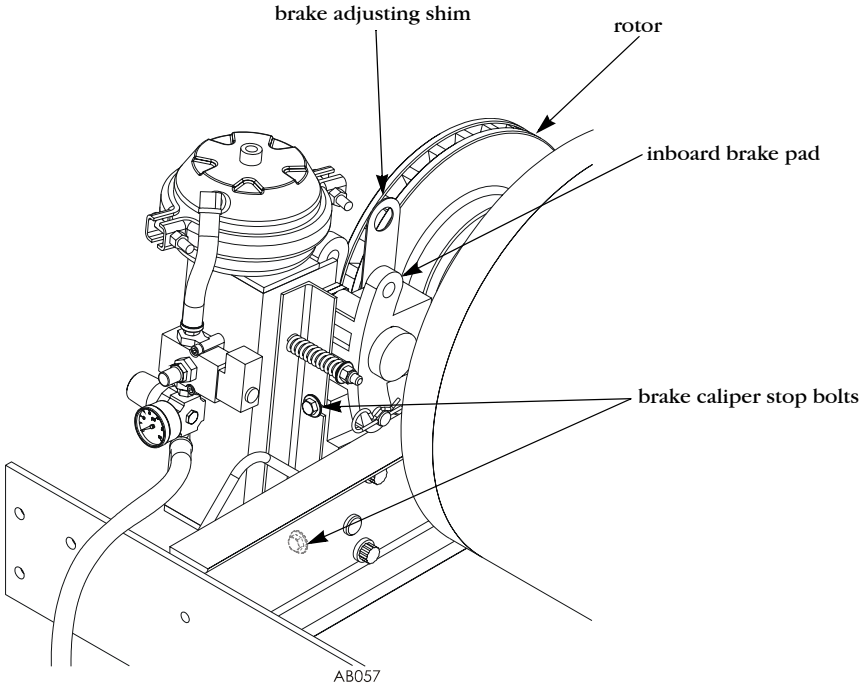


Figure 3-18: Adjust Brake Pad Clearance

COMPRESSED AIR PUMP ASSEMBLY

Refer to the Compressed Air Air Fuel Ratio Module Installation and User Guide (P/N 98200006) for proper operating and maintenance procedures. Refer to the Flow Meter User Guide (P/N 98129104) to test your air pump for accuracy. Failure to follow proper procedures may result in inaccurate data or damage to the equipment. These manuals can be found on your WinPEP CD or at www.dynojet.com.

The sensor and the copper sample tube are hot. Before touching the sensor or the sample tube, make sure it has cooled.

Leaded racing fuels and two-stroke applications will contaminate the sensor and dramatically shorten its service life.

The sensor is not covered by a warranty. Be sure to read and understand the Compressed Air Air Fuel Ratio Module Installation and User manual.

Before turning the pump on, verify there is no water in the hose.

Warm up the vehicle before placing the copper sample tube in the exhaust to avoid drawing excess water through the pump assembly.

Keep the air pump assembly upright. Tipping the pump assembly may result in damage to the sensor.

Leaks in the system will result in erroneous readings. Verify there are no cracks or holes in the hose. Verify the sensor is seated properly in the sensor block.

To ensure accurate readings, pump maintenance should be performed every six months, or sooner, depending on usage. Refer to the Compressed Air Air Fuel Ratio Module Installation and User Guide for more information.

EXTENDED CARRIAGE

Use the following instructions to install the extended support (P/N 78100003), install the trike carriage adapter (P/N 71300002), and install the extended carriage assembly.

You will need the following parts:

- 15331100 Chain Lube
- 21600019 Trike Extension Support
- 36580434 Bolt, 3/8-16 x 1/2", Button-head, Flange, Allen (7)
- 71300002 Trike Carriage Adapter Assembly
- 36500008 Capscrew, 5/16-UNC x 1", Button-head (5)
- 36500009 Capscrew, 3/8-16UNC x 1", Button-head (2)

INSTALLING THE EXTENSION SUPPORT AND TRIKE CARRIAGE ADAPTER ASSEMBLY

1 Secure the extension support to the dyno using seven 3/8 x 1/2-inch button-head flange bolts.

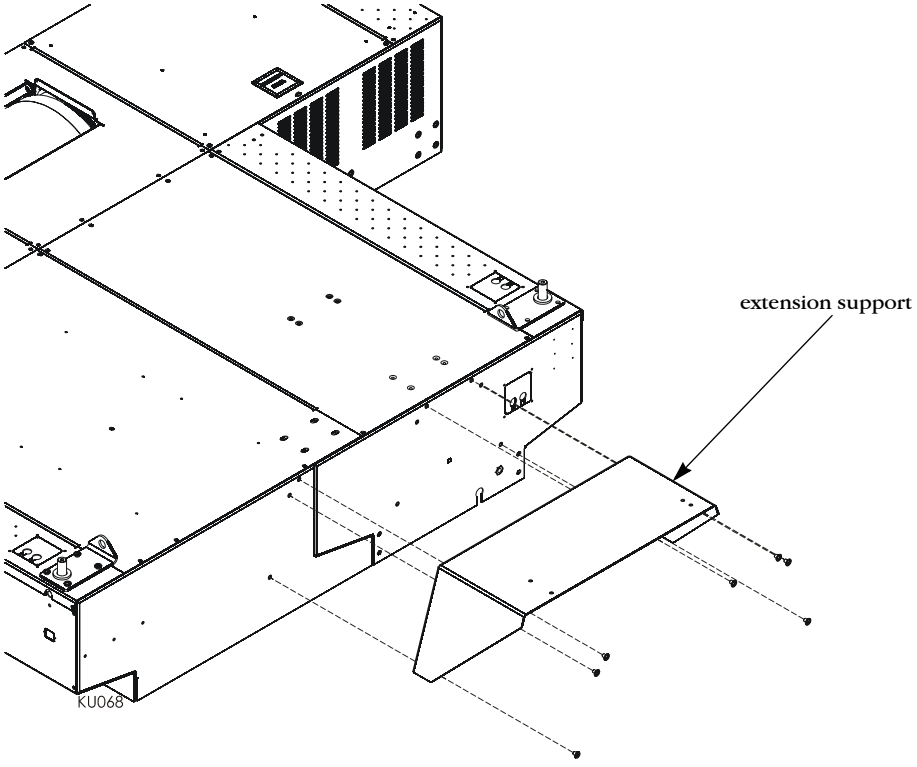


Figure 3-19: Installing the Extension Support

2 Secure the trike carriage adapter assembly to the dyno and the extended support using five 5/16 x 1-inch button-head bolts as shown in Figure 3-20.

3 Secure the trike carriage adapter assembly to the dyno and the extended support using two 3/8 x 1-inch button-head bolts as shown in Figure 3-20.

4 Lube the tracks with the included lube or use grease.

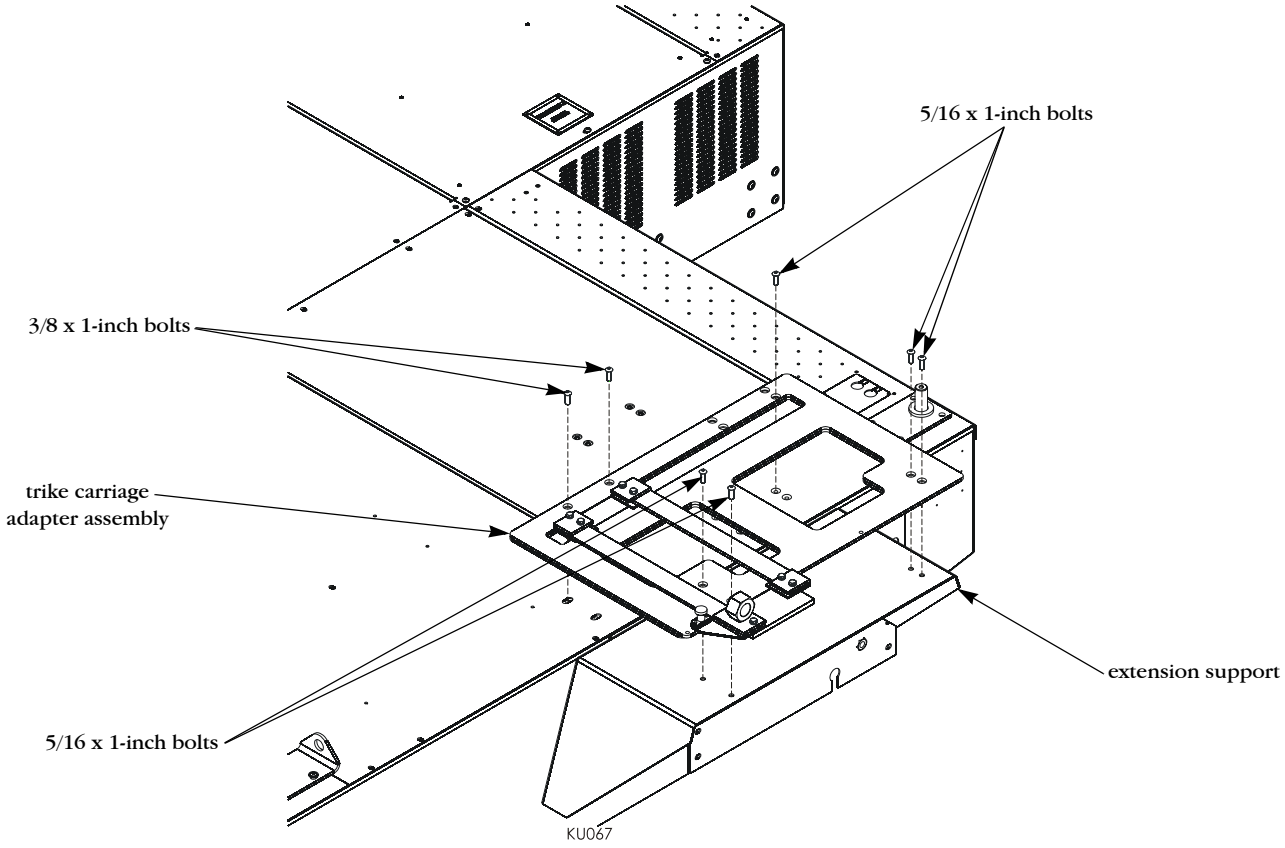


Figure 3-20: Install the Trike Carriage Adapter Assembly

INSTALLING THE EXTENDED CARRIAGE ASSEMBLY

1. If not already removed, remove the carriage screw from the extended carriage assembly by removing the four 1/4-20 x 1/2-inch button-head screws securing the bearing bracket and set aside.
2. Place the carriage screw with the bearing bracket into the nut block.
3. Using the hand crank, or the control panel to run the power carriage, run the carriage screw through the nut block until the screw is all the way in the nut block.
4. Starting from the back of the dyno, slide the extended carriage under the carriage clamps.

   Verify the carriage screw is seated into the screw support bracket on the extended carriage assembly.
5. Secure the bearing bracket to the extended carriage assembly using the four 1/4-20 x 1/2-inch button-head screws removed earlier.
6. Run the extended carriage assembly through the full range of motion and verify there is no binding.

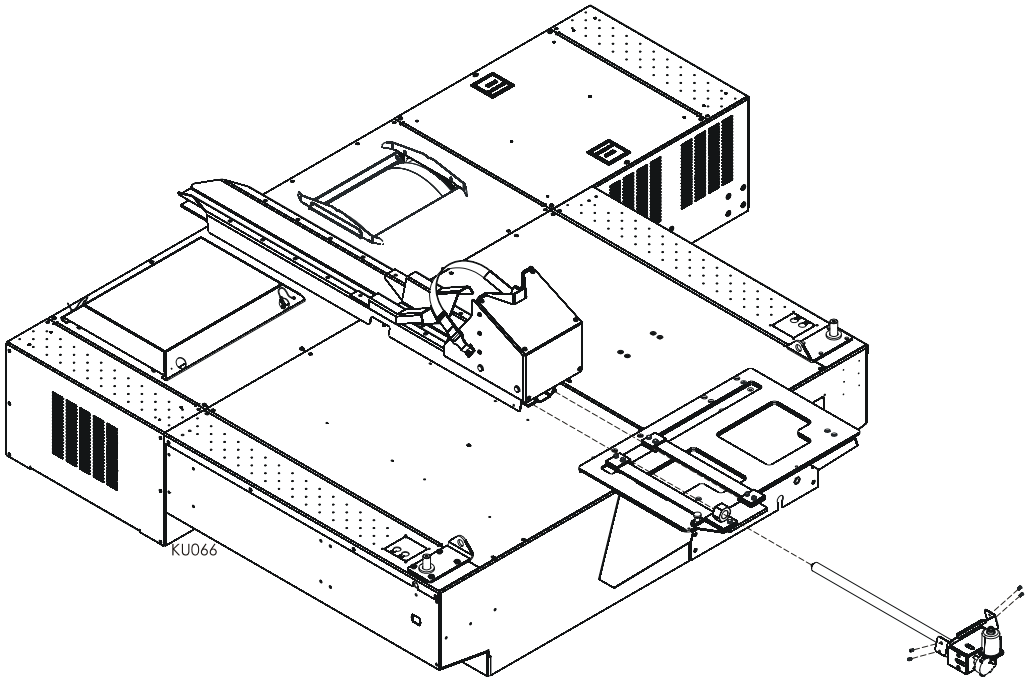


Figure 3-21: Installing the Extended Carriage Assembly

POWER CARRIAGE

The power carriage replaces the standard hand crank with an electrically powered tire carriage allowing you to easily adjust for various wheel base distances with the press of a button. This option is ideal for dynos that are recessed where the hand crank is difficult to access. The power carriage will also reduce the time spent making adjustments for various length motorcycles.

For more information on using the power carriage, refer to "Using the Power Carriage" on page 4-6.

You will need the following part:

- 82943001 Power Carriage

CAUTION

The power carriage motor is preset to be installed with the carriage screwed in all the way. Do not run the motor prior to installing it on your dyno.

WARNING

To prevent possible injury, open the CPI door and set the main breaker to the off position and unplug the dyno. Refer to Figure 3-1 for breaker location.

Removing the Hand Crank

1 Loosen the set screw on the hand crank and remove the hand crank.

2 Using a 7/16-inch wrench, remove the two bolts securing the flange bearing.

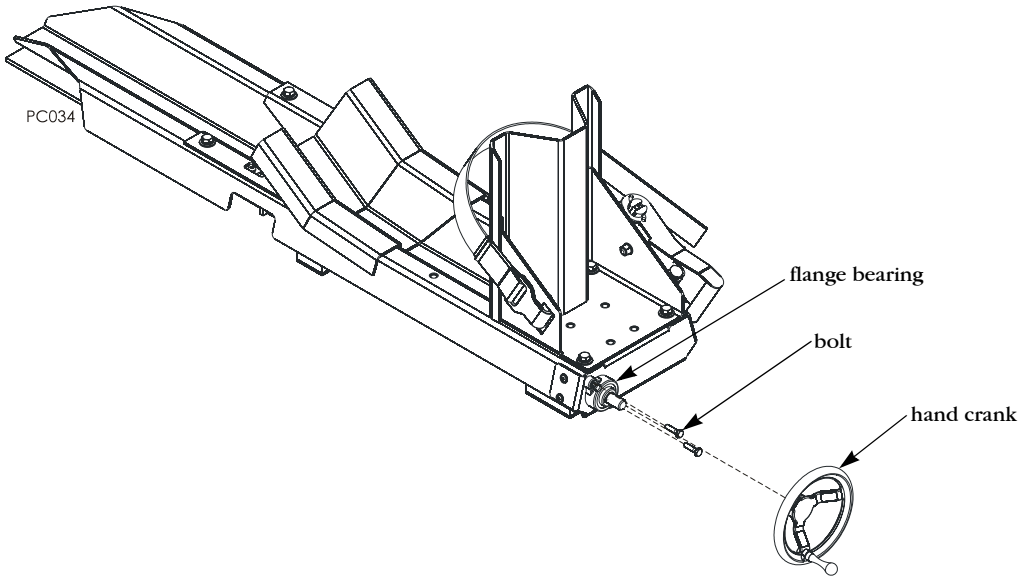


Figure 3-22: Remove the Hand Crank

INSTALLING THE POWER CARRIAGE

1 Remove the four screws securing the power carriage cover and set aside.

2 Insert the coupler jaw on the carriage screw making sure the inside of the coupler jaw is flush with the end of the carriage screw.

3 Secure the coupler jaw with the set screw.

4 Secure the motor mount to the carriage using two 1/4-20 x 1-inch bolts and two 1/4-inch lock washers. The motor mount is installed in front of the flange bearing. If the motor mount is already installed, skip this step and continue.

Note: The flange bearing must be facing so the grease zerk is accessible (facing down).

Note: Dynojet recommends using a 1/4-inch ratchet drive with an extension and a 7/16-inch shallow socket to secure the flange bearing bolts.

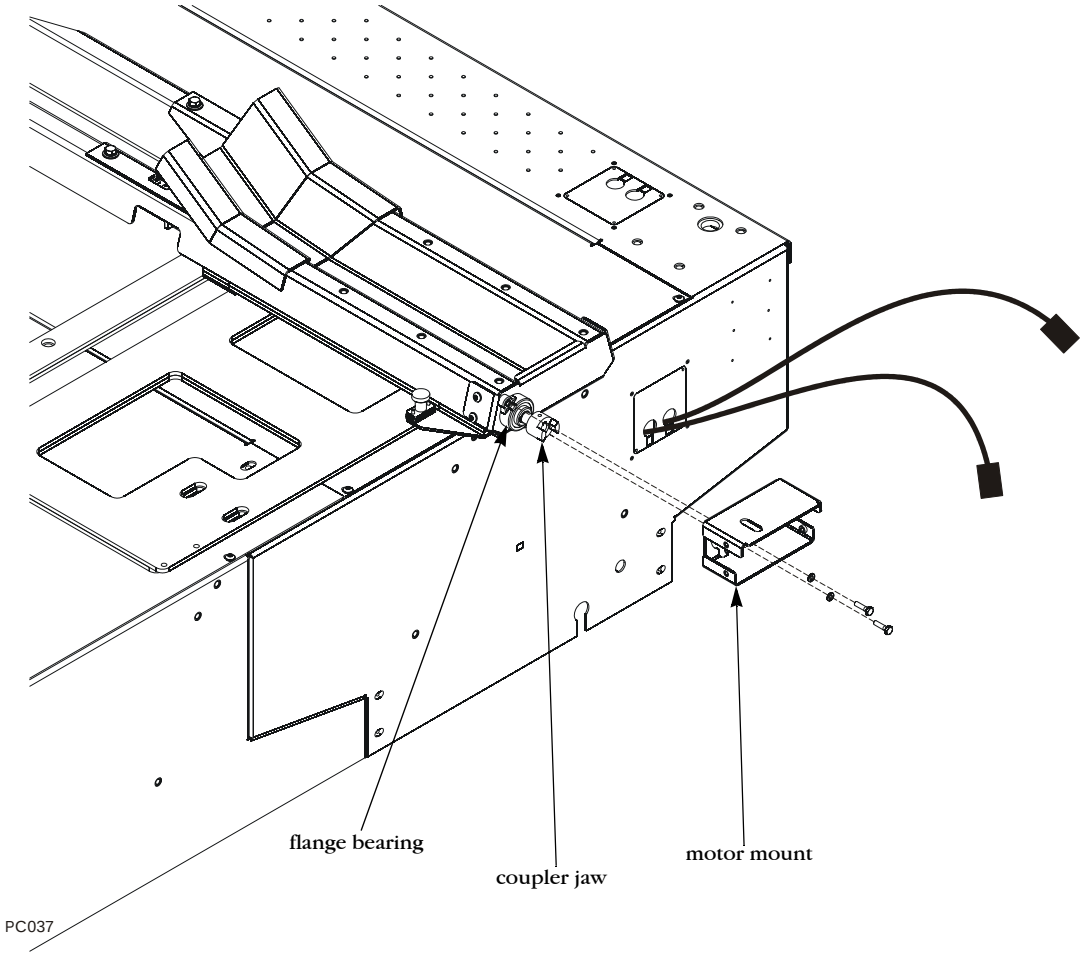


Figure 3-23: Install the Motor Mount

5 Bring the power carriage cable (two-pin connector) from the front of the dyno over to the motor mount. The routing for this cable was shown on page 2-32.

6 Secure the power carriage cable strain relief to the side of the motor assembly cover.

7 Insert the plastic coupler spider on the carriage screw half of the coupler.

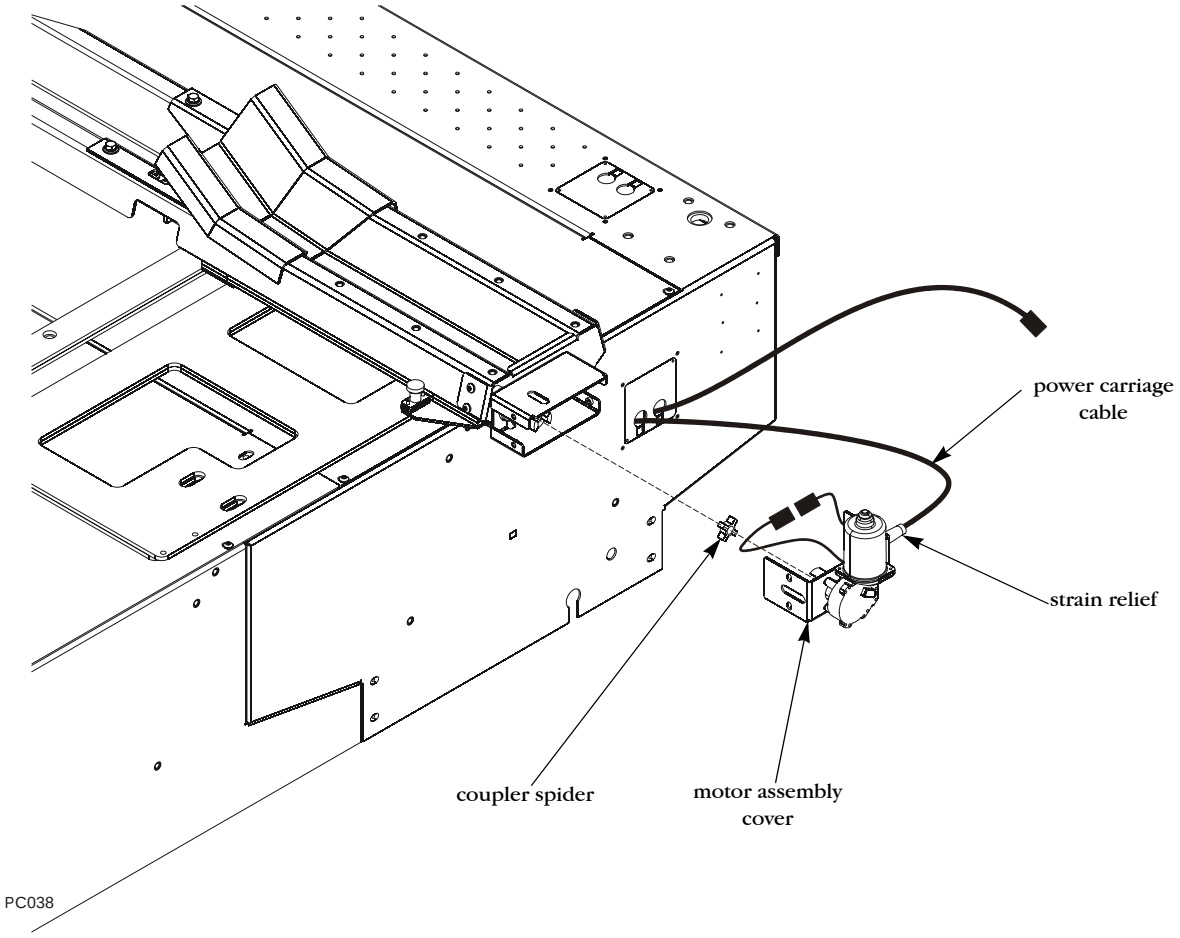


Figure 3-24: Secure the Strain Relief

8 Place the power carriage motor assembly near the motor mount and plug the motor connector into the power carriage cable.

9 Turn the carriage screw to align the coupler jaws with each other and slide the coupler jaws together until the motor assembly cover is flush with the motor mount.

10 Secure the motor assembly cover to the motor mount with four 1/4-20 x 1/2-inch button-head screws removed earlier.

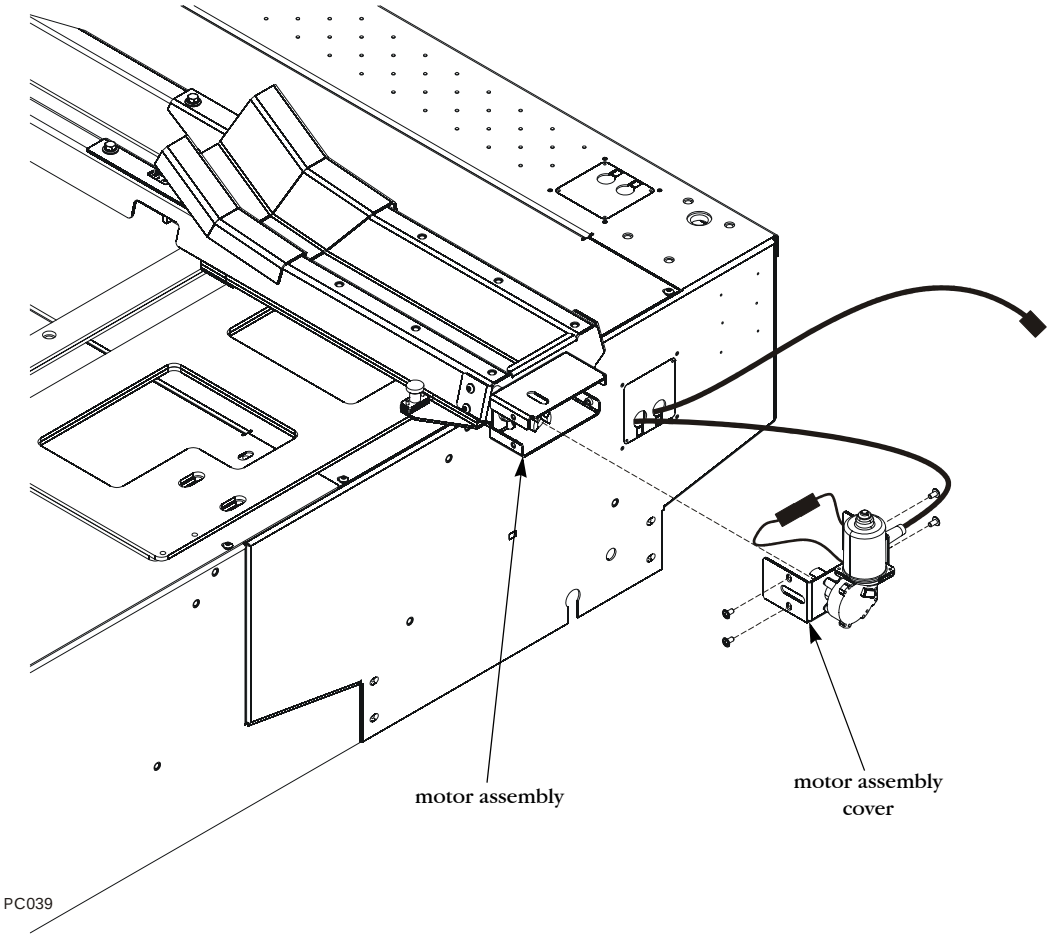


Figure 3-25: Assemble the Power Carriage

WHEEL CLAMP

The wheel clamp allows you to easily adjust for various wheel thicknesses with the press of a button. Refer to “Using the Wheel Clamp” on page 4-6 for more information on using the wheel clamp.

You will need the following parts:

- 71329000 Wheel Clamp Assembly
- DM150-002-004 Washer, 5/16", Lock (4)
- DM150-002-007 Washer, 5/16", Flat (4)
- DM150-019-012 Bolt, 3/8-16 x 1", Hex (4)

1 Remove the six 1/4-20 x 1-inch screws securing the wheel clamp cover. Remove the cover and set the cover and screws aside.

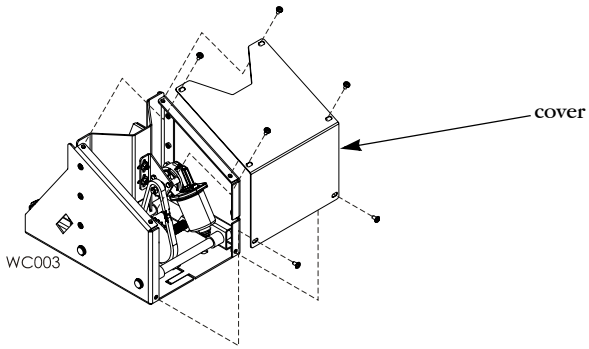


Figure 3-26: Remove the Wheel Clamp Cover

2 Place the wheel clamp on the carriage. Align the four holes on the wheel clamp with the holes on the carriage.

3 Secure the wheel clamp to the carriage using four 3/8-16 x 1/2-inch bolts, lock washers and flat washers.

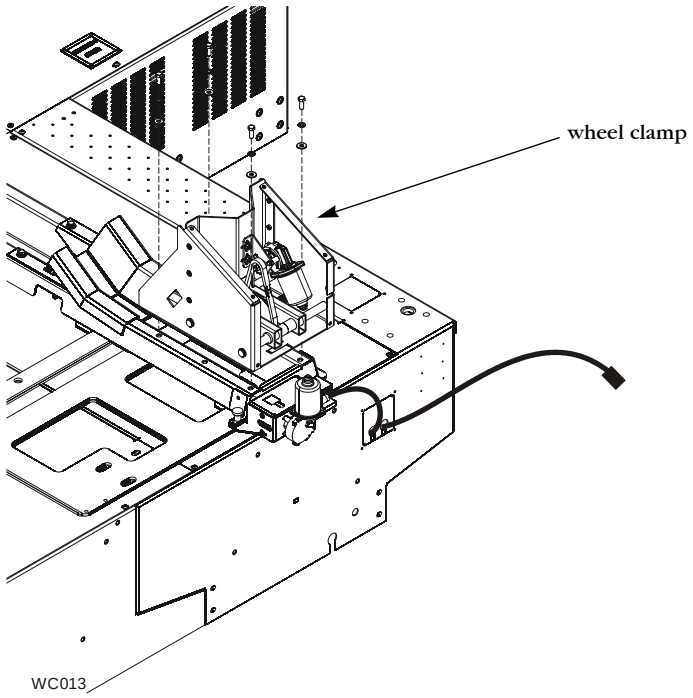


Figure 3-27: Secure the Wheel Clamp to the Carriage

4 Bring the wheel clamp cable (three-pin connector) from the front of the dyno over to the wheel clamp. This cable was routed on page 2-32.

5 Install the wheel clamp cable strain relief to the side of the wheel clamp.

6 Plug the wheel clamp cable into the connector on the wheel clamp motor.

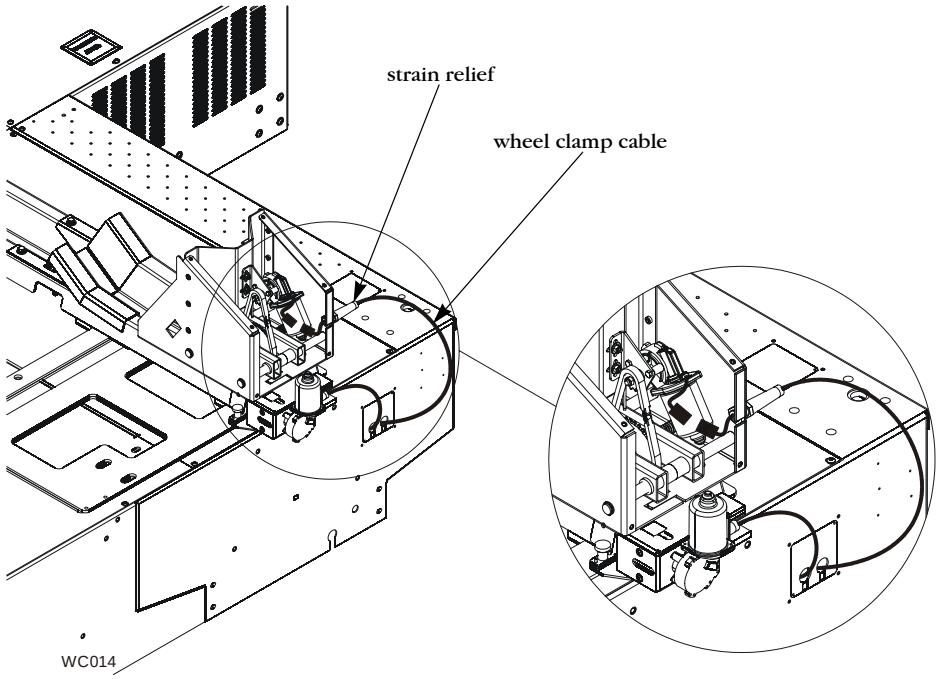


Figure 3-28: Install Wheel Clamp Strain Relief

7 Replace the wheel clamp cover.

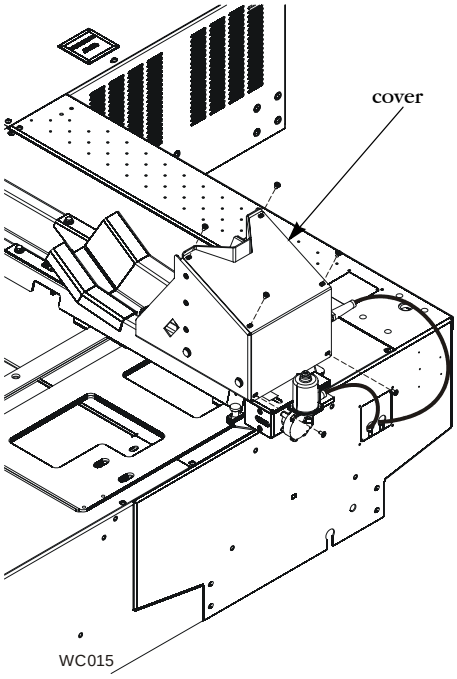


Figure 3-29: Replace the Wheel Clamp Cover

FINAL ADJUSTMENTS AND TESTS

After you have installed all of your additional accessories and routed all necessary cables, perform the following procedures to ensure the safe and effective operation of your dyno.

Note: Before replacing the top cover, if your country requires you install the safety switch, please refer to the instructions in Appendix B.

TURNING ON THE DYNO POWER

Use the following steps to connect (and disconnect) power to the dyno. Always turn the power off when connecting and disconnecting cables.

1 Turn on the main breaker inside the CPI door.

2 Plug the power plug into the power outlet

3 Replace the CPI cover if it was removed.

Note: Use the main breaker to turn power on and off to the dyno.

POWER CARRIAGE FINAL ADJUSTMENTS AND TESTS

Using the control panel, press the carriage forward and backward buttons and verify that the motor does turn. Refer to "Using the Power Carriage" on page 4-5 for more information on using the power carriage.

WHEEL CLAMP FINAL ADJUSTMENTS AND TESTS

1 Place a stack of catalogs into the wheel clamp.

2 Using the control panel, press the close button and observe that the wheel clamp does close. Hold the button until the motor turns off and the status light is on steady.

3 Press and hold the right hand wheel clamp button then press the left hand button to open the clamp.

Refer to "Using the Wheel Clamp" on page 4-6 for more information on using the control panel.

CHAPTER 4

CONTROL PANEL INTERFACE OPERATION

This chapter will walk you through the basic operating procedures and how to maintain and troubleshoot the components associated with the Control Panel Interface (CPI). To ensure safety and accuracy in the procedures, perform the procedures as they are described.

This chapter is divided into the following categories:

- Basic CPI Operation, page 4-2
- Power Distribution Assembly, page 4-8
- Maintenance and Troubleshooting, page 4-9

BASIC CPI OPERATION

The control panel may be mounted to either side of the tray for easy access by the dyno user while seated on the bike. The graphics on the control panel are grouped together according to function and color coded for ease of identification.
A description of the functions and displays follows:

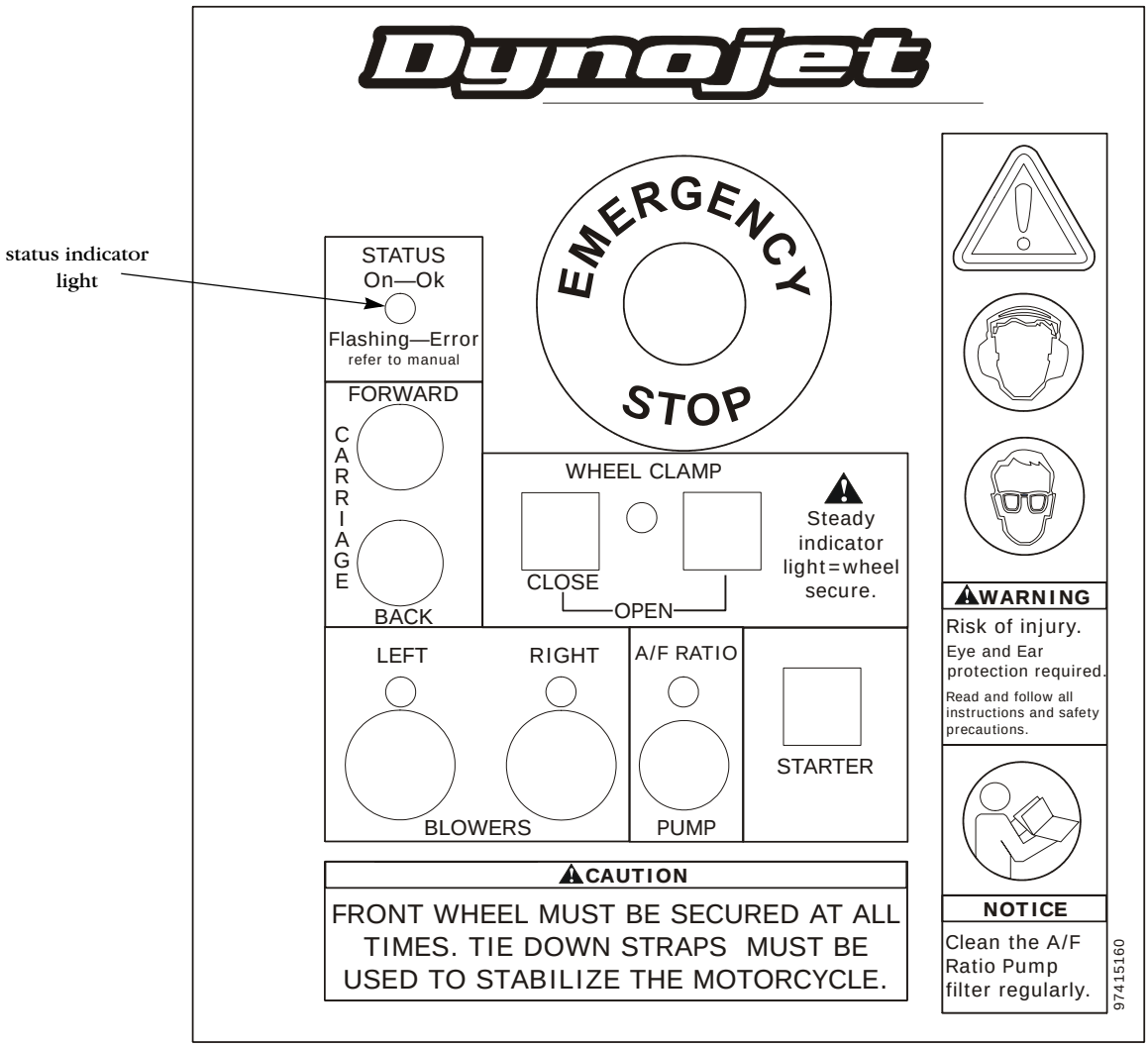


Figure 4-1: Control Panel Features

control panel feature	description
Air Fuel Ratio Air Pump	This optional accessory allows control of the internal air pump of the air fuel ratio sampling system. Refer to page 4-3 for more information.
Emergency Stop/Dyno Shutdown	Deactivates the dyno outputs whenever the button is pressed or the external E-Stop circuit is opened. Refer to page 4-4 for more information.
High Pressure Blowers (Blowers)	This optional accessory allows you to toggle the blowers on and off to control the temperature of the bike. Refer to page 4-4 for more information.
Power Carriage	This accessory requires the CPI and battery to operate. The power carriage allows you to move the bike forward and backward by remote control to center the bike's rear tire on the dyno drum. Refer to page 4-5 for more information.
Starter	Allows for spinning up the dyno drum to bump start bikes that may not have a starter. Refer to page 4-5 for more information.
Status Indicator	Provides information on the status of the CPI control and the various inputs to the CPI.
Wheel Clamp	This optional accessory requires the CPI and battery to operate. The wheel clamp allows for quicker loading and unloading of the bike. Refer to page 4-6 for more information.

USING THE AIR FUEL RATIO AIR PUMP

The CPI allows control of the optional internal air pump that is part of the air fuel ratio (AFR) sampling system. This air pump is built into the dyno to draw exhaust gases over the AFR sensor. The button on the control panel allows the dyno user to turn this pump on and off. The indicator light on the control panel will illuminate when power is provided to the pump.

If the pump does not run, check the following:

- Verify the switch on the pump assembly is on.
- Verify fuses F3 and F4 on the CPI board.
- If the E-Stop button is pressed or the external E-Stop circuit is open then the AFR pump will not run.

Refer to the Compressed Air Air Fuel Ratio Module Installation and User Guide for proper operating and maintenance procedures (P/N 98200006). Failure to follow proper procedures may result in inaccurate data or damage to the equipment. This manual can be found on your WinPEP CD or at www.dynojet.com.

Using the Emergency Stop/Dyno Shutdown

The emergency stop/dyno shutdown button is designed to deactivate the dyno outputs whenever the button is pressed or the external E-Stop circuit is opened. When E-Stop is activated the blowers will be turned off, the power carriage will stop, and the wheel clamp will stop. The starter will be deactivated as well as the AFR air pump and the retarder will be de-activated. If the dyno is properly equipped with the air brake option, the air brake will be applied stopping the dyno drum. If the air brake is not installed the drum will freewheel. During an E-Stop condition the Status Indicator light will be flashing with two short blinks on and long pause off.

Using the High Pressure Blowers

The CPI allows the dyno operator to toggle the optional high pressure blowers on and off from the control panel. If the E-Stop is activated the blowers will be automatically turned off. The indicator light by each button will light up when that blower output is turned on. If the toggle switch on the blower is turned off the blower will not operate even if the CPI output is on.

CAUTION

The blower outlets on the front of the dyno are designed to only work with Dynojet provided blowers. Connecting other electrical loads or other blowers to the outlets on the dyno may damage the dyno and void the warranty.

If the blower indicator light on the control panel is on but the blower is not running, perform the following steps.

1 Verify the switch on the blower is on.
2 Verify the blower power plug is firmly plugged into the dyno.
3 Verify the blower circuit breakers in the CPI.

   If the button on the breaker is extended, an overload has occurred and the breaker has tripped. Press in the breaker button to reset the breaker. If the breaker continues to trip, contact Dynojet.

Understanding Interlocks

The interlock circuit provides inputs for normally closed switches which open when it is not safe to run the dyno. Typically these switch inputs will be tied to safety gates and safety switches that are required in Europe. If the Interlock circuit is open the Status Indicator light will blink on and off with the on time equal to the off time. This will continue until this circuit is closed or an overriding E-Stop condition is sensed. In a dyno configured to comply with CE requirements the interlock signal will activate the drum air brake.

USING THE POWER CARRIAGE

This accessory requires the CPI and battery to operate. Use the control panel to activate the power carriage allowing you to center the bike's rear tire on the dyno drum.

The power carriage and wheel clamp cannot be activated at the same time.

Note: When operating the power carriage with a bike on the dyno, make sure the bike is in neutral.

Note: Always loosen or remove the bike tie-down straps before moving the carriage. Replace and tighten the straps when the bike is in the proper position.

Never perform a dyno run if the tie-down straps are not in place or they are damaged.

If the carriage movement is slow during parts of its travel, investigate and correct the source of the problems. If you reach the end of travel of the carriage or the carriage binds and you continue to hold down the carriage movement button, the motor will draw too much current and blow the carriage fuse F2. There is a short time delay built into the button operation to allow the carriage motor to coast to a stop before it moves in the opposite direction. This delay is needed to prevent the motor from drawing too much current by rapidly reversing the motor.

USING THE STARTER

The built-in starter allows you to use the momentum of the drum to start motorcycles that are not equipped with an on-board starting system. The starter requires a battery to operate. Refer to page 2-35 for more information on the battery.

If the E-Stop button is pressed, the starter will not engage. If the interlock circuit is open, the starter will not operate.

1 Make sure the dyno brakes are not activated.
2 Verify the bike is in neutral or disengage the clutch.
3 Press and hold the green starter button until the drum reaches maximum speed.
4 Release the green starter button.
5 Use the momentum of the drum to start the bike.

Note: Do not re-engage the starter while the drum is turning.

USING THE STATUS INDICATOR

The status indicator provides information on the status of the CPI control and the various inputs to the CPI.

- Status: Off—indicates the CPI may not be receiving power due to the dyno being turned off or lack of power being applied to the dyno.
- Status: Steady On—indicates all inputs into the CPI are okay for normal dyno operation and the CPI is receiving power.
- Status: Blinking—If the status indicator light is flashing with two short blinks on and a long pause off, the Emergency Stop circuit is open. This can be caused by the red button on the control panel being pressed or an external E-Stop (Emergency Stop) condition is being fed to the CPI board. The E-Stop circuit must be closed to allow for normal dyno operation.
- Status: Blinking—If the status indicator light is blinking with equal on and off time, the interlock signal into the CPI board is open. This signal monitors the condition of optional safety switches that will be attached to safety guards or the dyno room door when guards are not used; this will allow dyno operation only when the guards are in place or the door is closed. The E-Stop circuit takes precedence over the interlock input.

USING THE WHEEL CLAMP

This optional accessory requires the CPI and battery to operate. The wheel clamp allows for quicker bike loading and unloading. The internal mechanism in the wheel clamp closes on the bike's front wheel and tire to a calibrated amount of pressure securing the bike. The indicator light between the wheel clamp buttons provides status of the current state of the wheel clamp.

Pinch hazard. Keep hands, body parts, and other loose items clear. Failure to follow these instructions can result in serious injury or equipment damage.

Risk of injury. Be sure the wheel clamp is free and clear of any obstruction. Do not operate the dyno if the wheel clamp indicator light is not on steady.

CLOSING THE WHEEL CLAMP

CAUTION

Do not run into the edges of the wheel clamp pads with the bike tire. Make sure the wheel clamp is sufficiently open before loading the motorcycle.

1 Once the bike's front tire is fully seated in the clamp, press and hold the close button (left hand yellow square button).

As you hold the button, the wheel clamp mechanism will close on the bike's wheel and tire. The wheel clamp status light will blink as the clamp is closing.

WARNING

For proper and safe operation, the wheel clamp must grip the wheel as well as the tire. If the front tire is too wide to allow the clamp pads to grip the wheel, you must use the wheel strap.

2 Continue to hold the button down as the clamp applies pressure to the wheel and tire. During this process, the CPI is monitoring the current that is going to the wheel clamp.

When the wheel clamp has reached sufficient clamping force to secure the bike, the current drive to the wheel clamp is cut and the wheel clamp indicator light will turn on steady indicating that the wheel is secured.

WARNING

Do not operate the dyno if the wheel clamp indicator light is not on steady.

3 Pull back on the bike to verify the bike is secured.

4 Adjust the carriage to align the rear bike tire on the dyno drum.

5 Secure the bike with the tie-down straps.

WARNING

Never perform a dyno run if the tie-down straps are not in place or they are damaged.

OPENING THE WHEEL CLAMP

1 Press and hold the right hand yellow square button first, then press the left hand yellow button. The wheel clamp will start opening.

The status indicator light will be blinking to indicate the wheel is not secured and a dyno run should not be attempted.

2 Continue to open the clamp far enough to allow the next bike to be loaded easily.

POWER DISTRIBUTION ASSEMBLY

The Power Distribution Assembly, inside the CPI, has three circuit breakers to protect the internal dyno circuits, the main dyno circuit breaker and two blower circuit breakers.

Main Circuit Breaker

The main circuit breaker is rated for 240VAC at 30A and all of the power into the dyno passes through this breaker. In the event of a major overload or failure this breaker will trip. This breaker also provides the main disconnect for the dyno. When the handle is in the up position the dyno is connected to the incoming power. When the handle is in the down position all power into the dyno is turned off.

WARNING

Even if this breaker is turned off there is still the potential for lethal voltages to be present in the CPI. Always disconnect the main power plug before removing the covers.

High Pressure Blower Circuit Breakers

The high pressure blower (blower) circuits are protected by the two 15A breakers. In the event of a motor failure or other failure with the blowers these breakers could trip. The white button pops out to indicate the circuit has tripped. Pressing in the white button will reset the breaker. The top breaker protects the right blower circuit (right side of dyno as you are sitting on the bike) and the bottom breaker protects the left blower circuit. These breakers do not provide a manual disconnect.

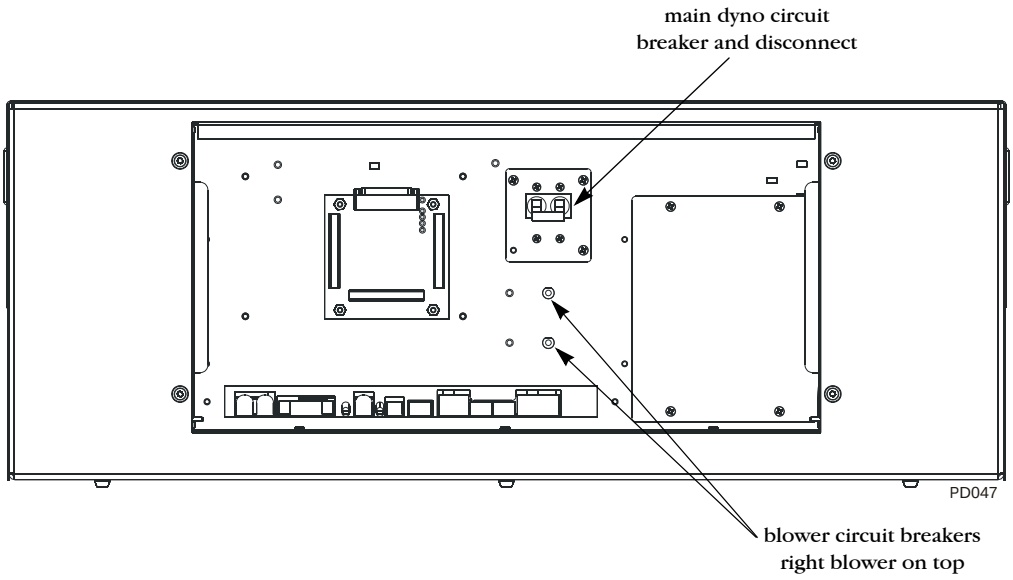


Figure 4-2: CPI Circuit Breakers

MAINTENANCE AND TROUBLESHOOTING

This section contains basic maintenance and troubleshooting information for the wheel clamp, theta controller fuses and CPI fuses.

MAINTAINING AND TROUBLESHOOTING THE WHEEL CLAMP

- Make sure the bike tire and wheel are clean to reduce the possibility of scratching the rim.
- Keep the wheel clamp pads clean using Isopropyl Alcohol. Do not allow any products to be applied or transferred to the wheel clamp that could interfere with the gripping action.
- If you run the clamp all the way open against the hard stops, the CPI will turn off the motor before any damage can occur.
- Follow the prescribed service for the wheel clamp lubrication for frequency and type of lube. Grease or lube the screw and slides monthly or every 500 bikes.
- Do not run into the edges of the wheel clamp pads with the bike tire.
- If the wheel clamp movement is binding for any reason, stop using the wheel clamp and correct the problem. It is possible for the wheel clamp to bind and give a false indication that the wheel is clamped.
- If the wheel has been clamped and the wheel clamp indicator light is on steady then the dyno power is turned off or the E-Stop activated, the wheel clamp indicator light will go back to the blinking state as the clamp status is unknown. Pressing the clamp button again will secure the clamp.
- If the E-Stop circuit is open or the Emergency Stop button is pressed, the wheel clamp will not operate.

Replacing the Theta Controller Fuses

The theta controller has two fuses.

WARNING

Hazardous voltage. To prevent possible injury, open the CPI door and set the main breaker to the off position and unplug the dyno. Refer to Figure 3-1 for breaker location.

1 Open the Control Panel Interface (CPI) cover and set aside.
2 Remove the four screws securing the blanking plate and remove the plate.
3 Reach through this opening to access the fuses on the theta controller.
4 Gently push the fuse holder slightly inward and rotate counterclockwise. Remove the fuse holder.
5 Replace the fuse with a fuse type listed below.

CAUTION

For continued protection against risk of fire, replace only with a fuse of the same type and having the same electrical rating

240V Theta Controller Fuses	120V Theta Controller Fuses
• Buss P/N BAF-15, 15A Fuse	• Buss P/N BAF-25, 25A Fuse
• Little Fuse, KLK 15	• Fast Blow, Dynojet P/N 54212501
• Fast Blow, Dynojet P/N 54211501	

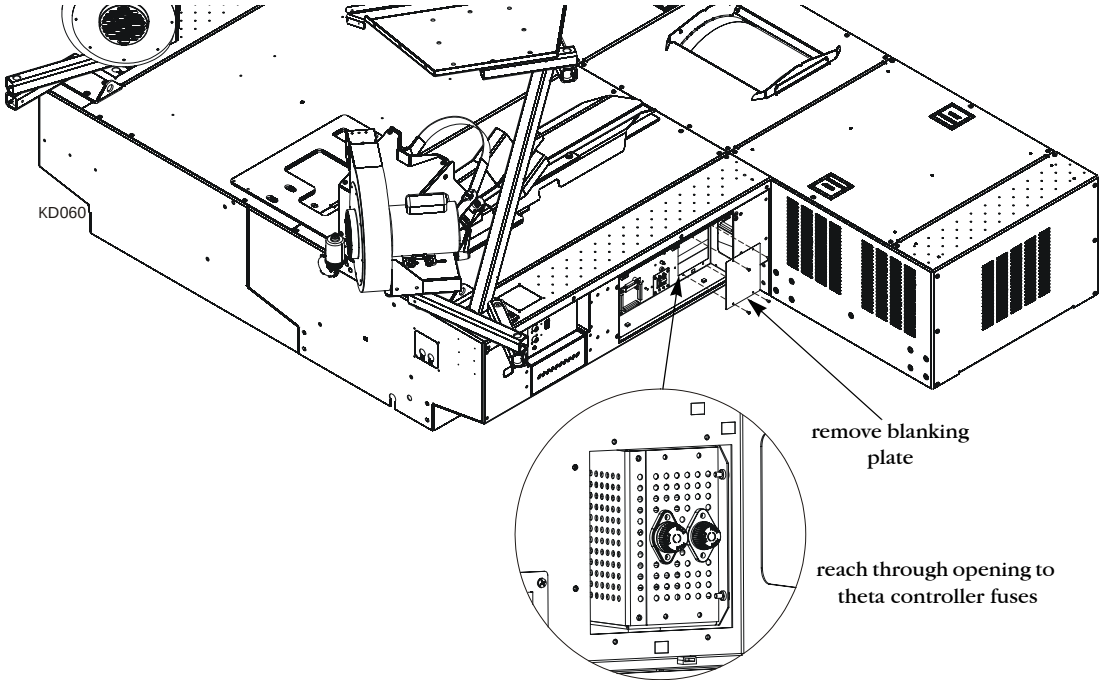


Figure 4-3: Replace Theta Controller Fuses

TROUBLESHOOTING CPI FUSES

Fuses F3 and F4 fuse the 240VAC as it enters the CPI board. One fuse is used for each leg of the 240VAC. If either of these fuses are blown there will be no power to the CPI board or any of the accessories. The Status Light on the board as well as the button panel will be off. Replace with a 5x20 mm 3A fast blow fuse.

Fuse F5 provides protection for the DC power that is produced by the on board power supply and routed to the CPI board. If this fuse is blown there will be no power to the CPI board or any of the accessories. The Status Light on the board as well as the button panel will be off. Replace with a 5x20 mm 3A fast blow fuse.

Fuse F6 provides protection for the power that is provided for the 12VDC accessories from the dyno owner installed car battery. This also protects the charging circuit to the battery. If this fuse is open the power carriage and the wheel clamp will not function. Replace with a 15A mini auto fuse.

Fuse F1 protects the wheel clamp drive circuit. If this fuse is open the wheel clamp motor will not activate. Replace with a 15A mini auto fuse.

Fuse F2 protects the power carriage drive circuit. If this fuse is open the power carriage motor will not activate. Replace with a 15A mini auto fuse.

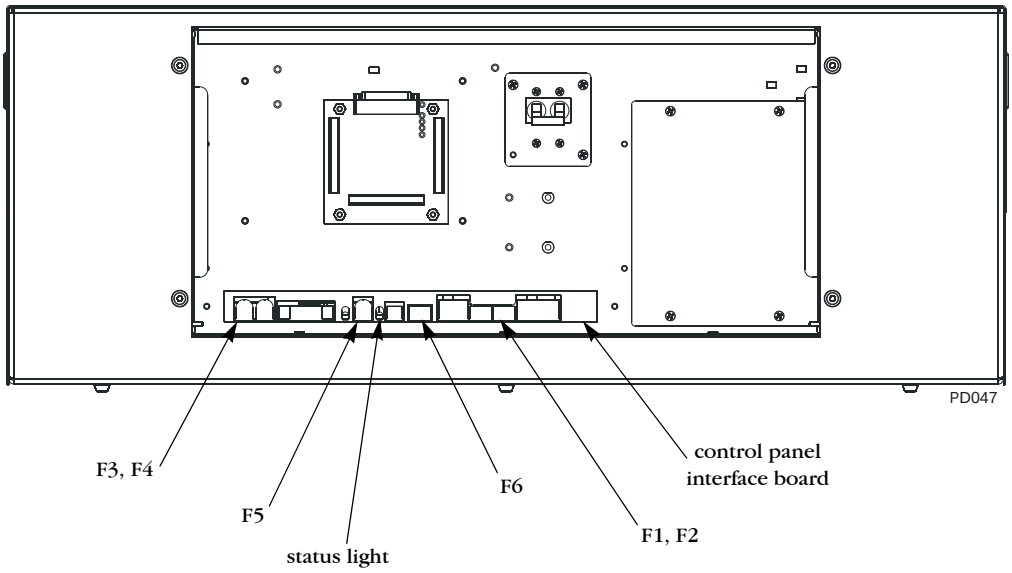


Figure 4-4: CPI Fuses

CHAPTER

5

BASIC DYNO OPERATION

This chapter includes instructions for basic dyno operation. For more detailed instructions, refer to the WinPEP 7 User Guide. This manual can be found on your WinPEP CD or at www.dynojet.com.

This chapter is divided into the following categories:

- Loading the Vehicle, page 5-2
- Connecting the RPM Pickup, page 5-4
- Pre-Run Inspection, page 5-7
- Making a Test Run, page 5-9
- Preventative Maintenance, page 5-10

LOADING THE VEHICLE

Use the following steps to load a vehicle on the dyno. For detailed information on loading a motorcycle on the dyno, refer to your motorcycle dyno installation guide.

WARNING

Risk of injury. Always wear proper eye and ear protection when operating the dyno.

1 Verify your computer is running. Set the dyno brake on by pressing the red button on the hand held pendant.
2 Turn the carriage screw handle (or use the control panel to run the power carriage) until the carriage is all the way out.
3 Drive the vehicle onto the dyno and align the vehicle straight with the dyno.
4 Stop the vehicle when the drive axle is centered on the drum.

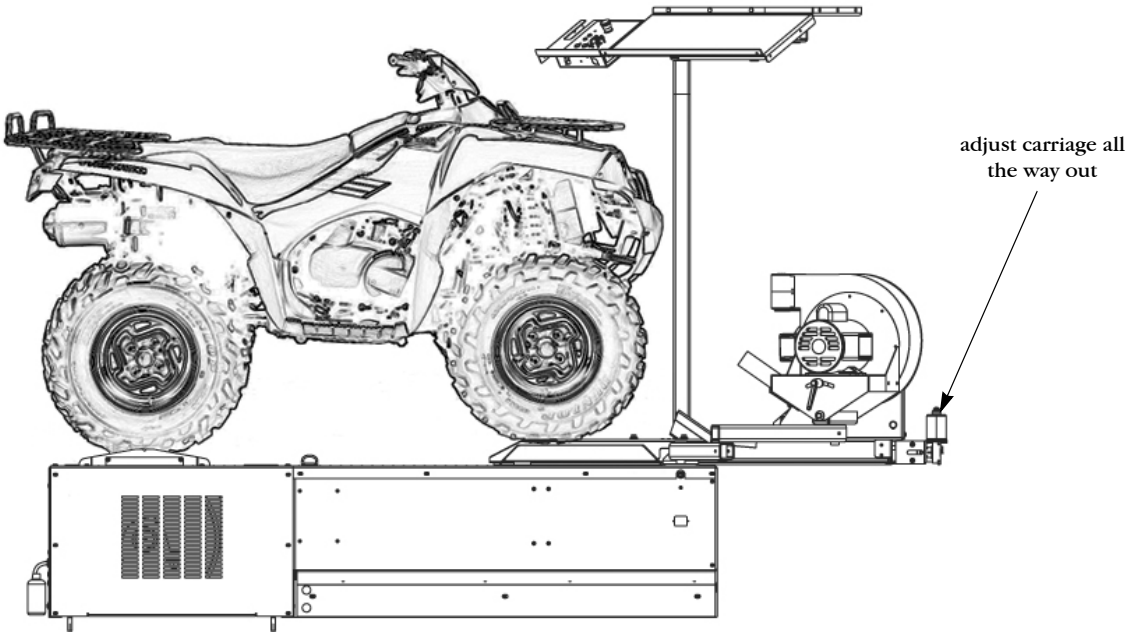


Figure 5-1: Load the Vehicle

5 When the vehicle is positioned properly on the dyno, shut the engine off.
   - If the vehicle has an automatic transmission, place it in park.
   - If the vehicle has a manual transmission, place it in gear.

6 Attach two tie-down straps from the ground hooks to the rear of the vehicle.

7 Attach two tie-down straps from the ground hooks to the front of the vehicle.

   Note: If you are running an all wheel drive ATV, use differential jacks to get the front wheels off the dyno.

   Note: When running an ATV, you may need to increase the tire pressure so the tire does not come in contact with the decking.

8 Tighten the four tie-down straps evenly making sure the drive wheels remain centered on the drum.

WARNING

Never perform a dyno run if the tie-down straps are not in place or they are damaged.

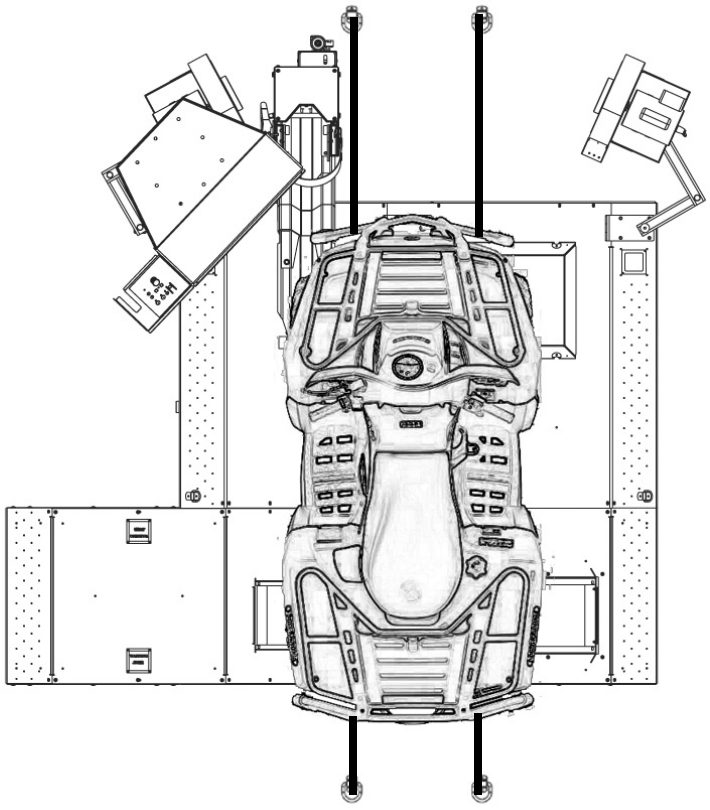


Figure 5-2: Load the Vehicle—Top View

CONNECTING THE RPM PICKUP

Your Dynojet dynamometer includes a primary wire inductive pickup and two secondary wire inductive pickups. These small "clothespin like" inductive pickups are used to sense RPM. An RPM pickup is required if you want to view torque graphs. Generally you will use one secondary wire inductive pickup on a spark plug wire. Vehicles with wasted spark ignition systems may require two secondary inductive pickups. On a wasted spark ignition, typically one coil will be connected to two spark plug wires. Attach one secondary pickup to each of these wires. If the pickups are connected to two plug wires that do not fire at the same time, an erratic RPM readout may occur. The primary wire inductive pickup senses RPM pulses from the coil. Although this pickup location generally works better, it is harder to find the correct location to connect the RPM pickup.

Note: If a pickup is not being used, disconnect it from the dyno electronics to prevent any stray pick up of signals.

CAUTION

Inductive pickups are very fragile. The ferrite core can easily be damaged and is not covered under warranty. Dropping, snapping, vibration, and heat can all damage the ferrite core.

The dyno electronics RPM module contains the electronics that sense the RPM pulses. An auto-gain circuit looks at only the peak voltage of the vehicle's spark, ignoring the lower voltages to help reduce electronic noise problems. Wasted spark ignition systems will produce a lower voltage level on the exhaust stroke than the compression stroke. By definition of the auto-gain circuit, lower voltage spark levels will be ignored, missing every other spark the vehicle would produce.

RPM Pickup Descriptions

RPM pickup	description
Secondaries (Non- wasted spark system)	Use one secondary pickup. Unplug the other pickup from the RPM module and set the degrees between plug fires to 720° in WinPEP 7.
Secondaries (Wasted spark ignition system)	Use two secondary pickups. Attach one pickup on each spark plug wire on the same coil and set the degrees between plug fires to 360° in WinPEP 7.
Primary pickup	Attach the primary wire pickup to the primary side of the coil. Set the degrees between plug fires by taking 720 (four cycle engines) or 360 (two cycle engines) divided by the number of coils. For example, the number of degrees between plug fires on a four cylinder four cycle engine with dual coils (where each coil fires two cylinders) is 720/4 x 2 = 360°.

CONNECTING THE SECONDARY INDUCTIVE PICKUP

The secondary inductive pickup cannot be in contact with, or it's connecting wire be crossing, other engine electrical wires or stray RF interference may result.

WARNING

The inductive pickups contain a fragile Ferrite Core that is sensitive to engine heat and vibration. Do not drop the inductive pickup or snap the pickup closed. Use extreme care in handling and placement of the pickups.

1 Clip the secondary inductive pickup around one spark plug wire.

Note: On a wasted spark ignition system, two secondary inductive pickup wires may be needed.

2 Route the inductive pickup cable clear of devices that produce electronic noise (spark plug wires, coil wire, coil etc.) to the dyno electronics RPM module.

Note: Inductive pickup placement is important. Position the inductive pickup so that it is not making contact with any other spark plug wires. Separate the spark plug wire from the spark plug wire bundle for proper operation.

Note: You must ground the vehicle to the dyno for the electronics to function properly.

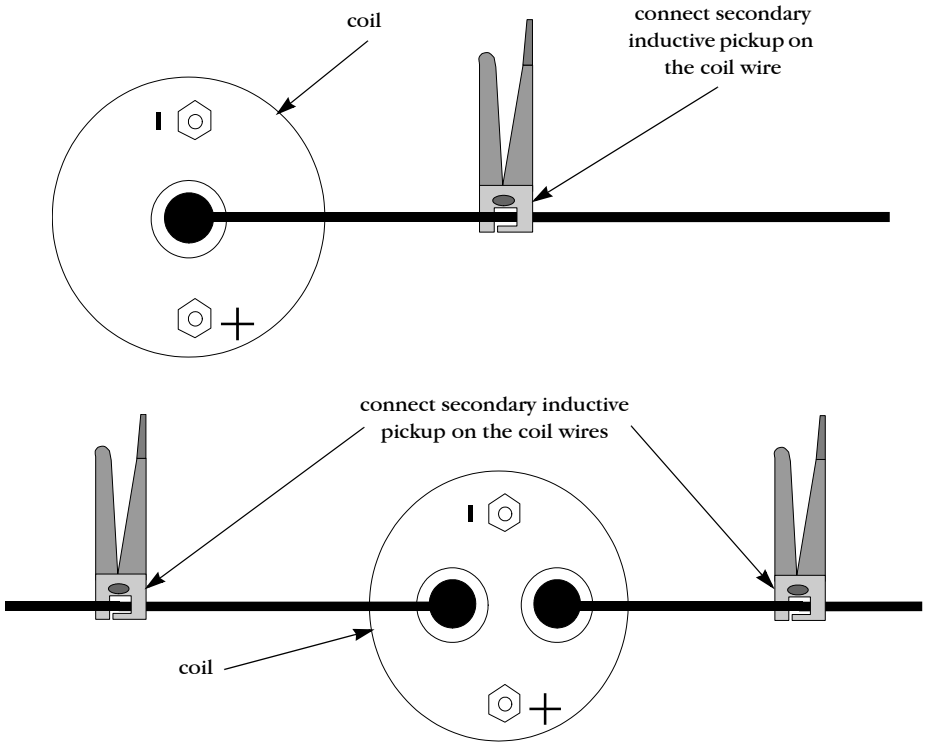


Figure 5-3: Connect the Secondary Inductive Pickup

CONNECTING THE PRIMARY INDUCTIVE PICKUP

The primary inductive pickup cannot be in contact with, or it's connecting wire be crossing, other engine electrical wires or stray RF interference may result.

WARNING

The inductive pickups contain a fragile Ferrite Core that is sensitive to engine heat and vibration. Do not drop the inductive pickup or snap the pickup closed. Use extreme care in handling and placement of the pickups.

1 Clip the primary inductive pickup around the wire to the primary side of the coil.

2 Route the primary wire cable clear of devices that produce electronic noise to the dyno electronics RPM module.

Note: You must ground the vehicle to the dyno for the electronics to function properly.

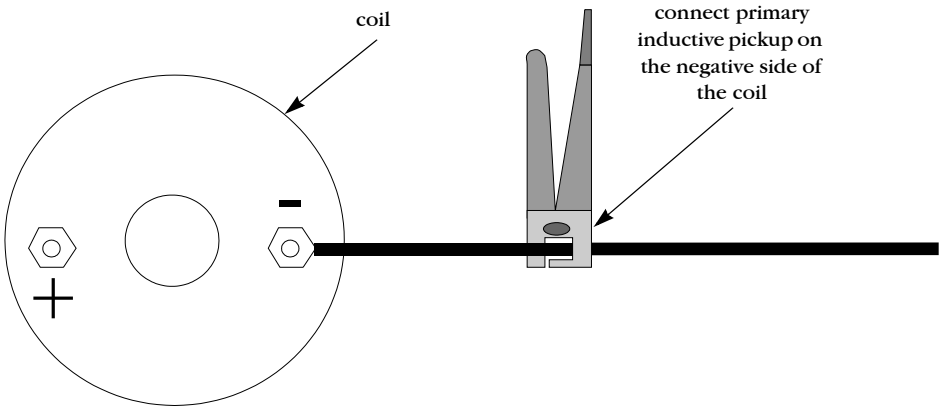


Figure 5-4: Connect the Primary Inductive Pickup

PRE-RUN INSPECTION

Perform a vehicle inspection before making a run. Check the following:

- Check the radiator coolant (if applicable) and oil levels.
- Check the fuel source.
- Rotate the drum and check for rocks caught in the tire tread that could fly out.
- For motorcycles, check the chain and the chain master link. Make sure it is lubricated and adjusted to the proper tension.
- Check the tire pressure and tire speed rating. Improperly inflated tires or exceeding the maximum speed rating can result in premature wear or severe tire damage. Make sure the tire has no major deficiencies (cracks in sidewalls, tread life, etc.).

  Note: When running an ATV, you may need to increase the tire pressure so the tire does not come in contact with the decking.
- Visually inspect the vehicle. Make sure it is in safe running order.
- Make sure ear protection and safety glasses are used when the dyno is being operated.
- Check the tie-down straps to make sure that they are tight and secured.
- Check the drive tires to be sure that they are aligned correctly on the dynamometer's drums.
- Keep all rotating components clear at all times.
- Only the operator should be near the dyno or the vehicle during the test.
- Never allow any person(s) to stand behind the dyno or vehicle when it is being operated.
- Perform any other safety inspections appropriate to running your vehicle on the dyno.

Never allow any person(s) to stand behind the dyno or vehicle when it is being operated. Only the operator should be near the dyno or the vehicle during the test.

Before Starting the Engine

Connect an exhaust hose or hoses (if dual exhaust) on the vehicle, make sure the hose fits over the tail pipe, is not plugged or kinked and the hose is vented correctly out of the dyno room.

Engine exhaust contains poisonous carbon monoxide gas. Breathing it could cause death. Operate machine in well ventilated area.

Engine Warm Up

Warm the vehicle's engine and drivetrain before beginning testing. Consistent engine temperatures will assure your runs are repeatable.

After Engine Warm Up

Always leave the vehicle in neutral (automatic transmission) or in first gear (manual transmission), with the engine off, and make sure the park brake and the dyno brake are on when you get off the vehicle on the dyno.

- Fix any fuel, oil, or coolant leaks that may have shown up after engine warm up and check the carburetor for leaks.
- Any loud or unusual engine noises or excessive exhaust smoke should be resolved before continuing.

MAKING A TEST RUN

Dyno runs provide safe, reliable road testing right in the shop. The dyno allows you to measure, record, and diagnose performance problems quickly. The dyno combined with WinPEP 7 produces consistent, easily interpretable power graphs. Use the following instructions to ensure repeatable and accurate measurements.

1 Verify the vehicle is secured properly.

2 Place the vehicle in a low gear and release the dyno brake using the hand held pendant.

3 Slowly accelerate the vehicle to 20 m.p.h.

4 Test the tachometer operation.

  4a Rev the engine. The gauges on the computer screen should be moving. If the tachometer is moving but not registering the correct RPM values, the number of degrees of revolution of the crank shaft (the plug fires number) is incorrect.

  4b Stop the vehicle, return to the MakeRun Configuration dialog box, and enter the correct value for the plug firing order.

5 Press the red brake button to apply 100% braking and slow down the vehicle.

CAUTION

Using the vehicle's own brakes to slow or stop the drum at speeds over 30 m.p.h. can severely over heat the brake parts. Dynojet dynamometers with the air brake or eddy current brake accessory can be used to slow the vehicle and drum to a full stop at any speed. The vehicle's brakes should be used in an emergency stop situation only.

6 Shut the engine off and put the vehicle in gear (manual transmission) or park (automatic transmission).

7 Set the vehicle's parking brake and leave the dyno brake on.

8 Perform a final inspection.

- Verify the drive tire's alignment on the dyno drums.
- Make any adjustments to the tie-down straps as needed.
- Perform any other safety checks that you deem appropriate to your particular situation.

You are now ready to make a high speed run on the dyno. Refer to your WinPep 7 User Guide for more detailed instructions.

PREVENTATIVE MAINTENANCE

This section contains basic preventative maintenance and troubleshooting information for the wheel clamp and CPI fuses.

To maintain proper dynamometer operation, Dynojet recommends you make routine checks of the dyno.

- Drum—keep the drum clean and keep all objects clear of the drum.
- Brake Pads—check the brake pad clearance regularly. Change the brake pads when they are worn to less than 0.060 inch thick.
- Carriage Slide—keep the carriage slide and screw clean and lightly lubricated.
- Check all air fittings for leaks monthly. Correct any leaks found.
- Once per month verify that the drum brake pressure gauge reads 55 to 65psi (380 to 450kPa). Adjust regulator if pressure is out of specification.

APPENDIX

A

RED HEAD ANCHOR INSTALLATION

This appendix contains instructions for installing the Red Head Multi-Set™ II Anchors. The anchors will be used to secure the dyno to concrete. To ensure safety and accuracy in the procedures, perform the procedures as they are described. Be sure to read and understand the warnings included in this appendix.

WARNINGS

WARNING

Always wear safety glasses and other necessary protective devices or apparel when installing or working with anchors.

CAUTION

ITW Ramset/Red Head Multi-Set II Anchors are designed to operate properly only when installed with ITW Ramset/Red Head brand Setting Tools.

The use of a 24 to 40 ounce hammer is recommended for expanding Multi-Set II anchors.

The use of carbide drill bits manufactured with ANSI B94. 12-77 drill bit diameter requirements is recommended for installation of this anchor.

Not recommended for use in lightweight masonry material such as block or brick.

Use of core drills is not recommended to drill holes for use with this anchor.

Not recommended for use in new concrete which has not had sufficient time to cure.

Anchor spacing and edge distance requirements (anchor installation locations) are the responsibility of the engineer of record.

CONTACT INFORMATION FOR ITW RAMSET/RED HEAD

Contact ITW Ramset/Red Head at 1-630-350-0370, or 1300 North Michael Drive, Wood Dale, IL 60191.

INSTALLATION

Use the table below to determine the catalog number, drill bit size, minimum hole depth, and setting tool catalog number.

catalog number	drill bit size	minimum hole depth	setting tool catalog number
Carbon Steel RM-38/RL-38 (9.5 mm)	1/2-inch	1 5/8-inch (41.2 mm)	RT-138

Use the following instructions to install the Red Head anchors.

1 Drill the hole in the concrete the same outside diameter as the anchor being used to any depth exceeding minimum embedment.

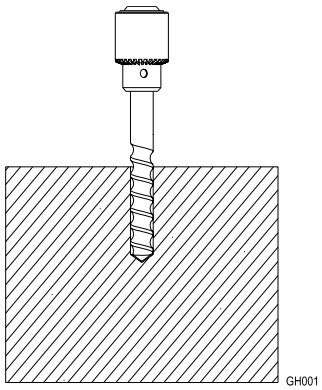


Figure A-1: Red Head Anchor—Drill the Hole

2 Insert the anchor.

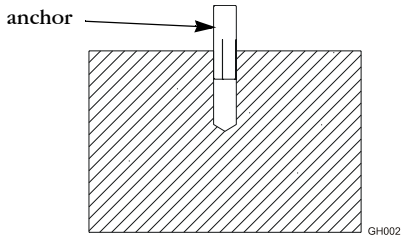


Figure A-2: Red Head Anchor—Insert the Anchor

3 Using a hammer, drive the anchor flush with the surface of the concrete, or below the surface if the hole depth exceeds minimum embedment.

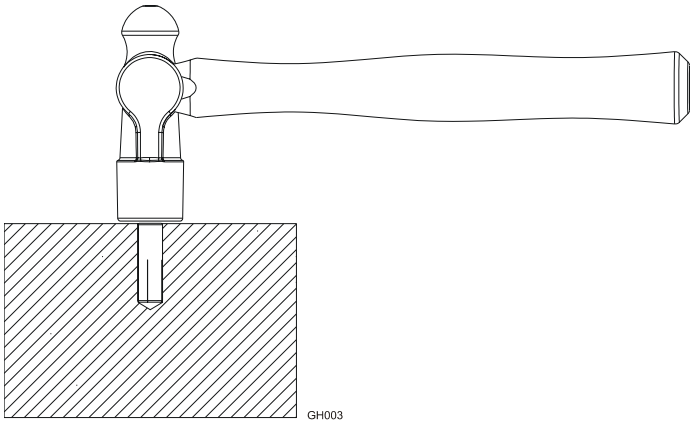


Figure A-3: Red Head Anchor—Drive the Anchor Flush

4 Using a hammer, expand the anchor with the setting tool. The anchor is properly expanded when the shoulder of the setting tool is flush with the top of the anchor.

Note: Use only Ramset/Red Head setting tools to insure proper installtion.

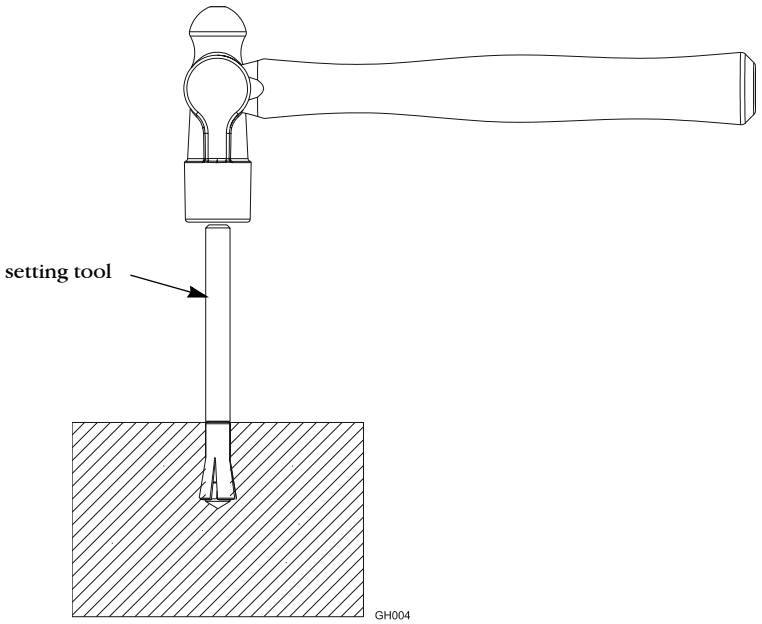


Figure A-4: Red Head Anchor—Expand the Anchor

APPENDIX

B

POWER REQUIREMENTS AND INSTALLATION

Different countries have different standards for delivery of AC (alternating current) electricity to homes and buildings. The frequency (number of cycles per second) in Hertz (Hz) varies from country to country.

North America typically uses 60 Hz power. Western Japan including the Osaka, Kyoto, Nagoya, Hiroshima regions also uses 60 Hz power. Eastern Japan including the Tokyo, Kawasaki, Sapporo, Yokohama, and Sendai regions uses 50 Hz power.

Many other countries, such as Germany, the Netherlands and most European Union countries have standardized on 50 Hz.

To ensure safety and accuracy in the procedures, perform the procedures as they are described.

This Appendix is divided into the following categories:

- Locations Using 60 Hz Power (North America and Japan), page B-2
- Locations Using 50 Hz Power (Locations other than North America and Japan), page B-7.

LOCATIONS USING 60 HZ POWER (NORTH AMERICA AND JAPAN)

The following power requirements and instructions are for North America, much of Japan, and other locations using 60 Hz power. All other locations should refer to the instructions found in "Locations Using 50 Hz Power (Locations other than North America and Japan)" on page B-7.

The model 200iX/250iX dynamometer requires a dedicated 240VAC single phase power outlet rated for 30A for proper operation. **Failure to follow these instructions could result in personal injury or damage to the dyno.** Connecting the dyno to the incorrect voltage will void the dyno warranty. Contact Dynojet with any questions.

The model 200iX/250iX dynamometer requires a dedicated wall receptacle which must be wired for operation and is included with the dyno or may be shipped in advance in a separate package. The dyno is equipped with a ten foot power cord with a twist lock plug pre-wired on the end. The power cord is located at the front of the dyno, but is shipped inside of the dyno. For more information on the location and routing instructions for the power cord refer to your dyno installation guide.

The dedicated wall receptacle is a twist lock four wire grounded 30A NEMA L14-30 type and must be wired in accordance with local building codes and requirements. If the facility does not have 120/240 volt single phase power, and it does have 120/208 volt three phase Y power, then it is acceptable to connect the four-wire receptacle with two of the three phase lines, the neutral and the ground. With this arrangement, there will only be 208 volts between line 1 and line 2 instead of 240 volts. This is acceptable, but performance of the retarder will be reduced. **In no case shall all three phase lines be connected to the receptacle!** Installation may require a licensed electrician and must conform to UL and NEC safety standards.

> **Note:** If you are installing your dyno in North America or Japan and the dyno is not equipped with twist lock four wire grounded plug, contact Dynojet before attempting to connect the dyno.

Local and national electrical codes require a grounded receptacle box.

- This circuit should have a dedicated 30A double pole circuit breaker.
- The dyno should be the only device connected to this circuit.
- It may be necessary to install a delayed trip breaker due to the inrush current drawn by the high pressure blowers.

INSTALLING THE WALL RECEPTACLE

The wall receptacle is included with your dyno and is shipped in a box in the center of your dyno or may be shipped in advance in a separate package.

The wall receptacle is a single phase 240 volt 30A dedicated circuit with a neutral connection and a ground. The neutral connection is required to split the 240 volt into two 120 volt connections internal to the dyno.

The cable carrying the power to this receptacle should be ten gauge or larger. Check with local building codes for the correct size.

1 Connect one of the 240V legs (line 1) to the X terminal (gold colored screw).
2 Connect the other 240V leg (line 2) to the Y terminal (gold colored screw).
3 Connect the neutral conductor to the W or WH terminal (silver screw).
4 Connect the ground conductor to the green grounding screw.

TESTING FOR CORRECT VOLTAGES

You must test the receptacle for proper voltages before the dyno is connected to the outlet.

CAUTION

If the voltage readings do not match the following table, DO NOT connect the dyno. You must have a licensed electrician correct the power connection. Connecting the dyno to the incorrect voltage can result in damage to the dyno and will void the dyno warranty. Contact Dynojet with any questions.

Using a voltmeter that is capable of measuring AC voltage, measure between the points listed below and verify that the correct voltages are present.

probe 1	probe 2	desired voltage measurement
2	4	216V to 260V*
1	4	108V to 130V
1	2	108V to 130V
1	3	<5V
3	box	<5V

*If using two of the three phase lines of a 120/208V 3 phase Y system, then expect to see 187V to 225V.

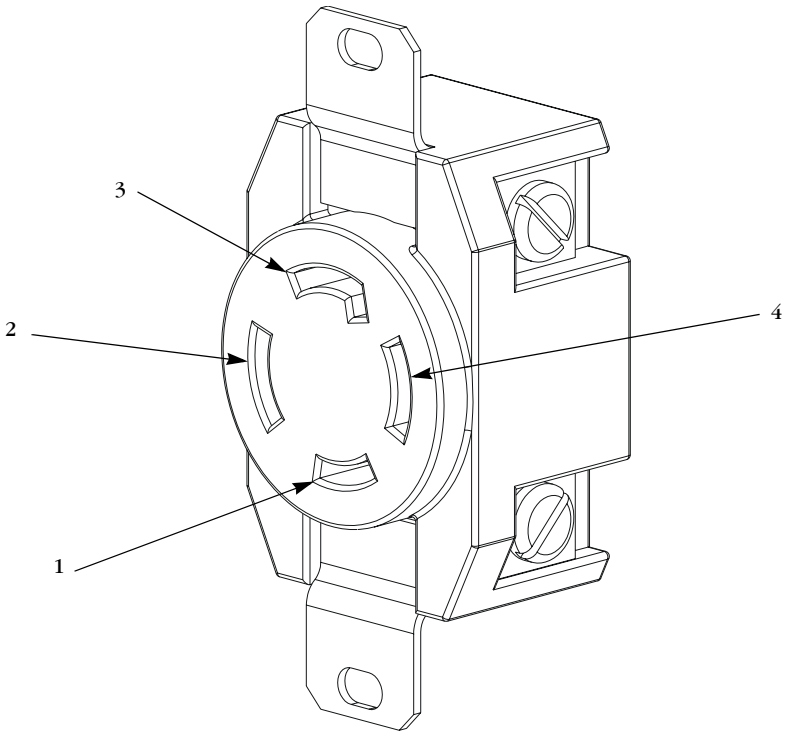


Figure B-1: Dedicated Power Receptacle

REPLACING THE POWER PLUG

Use the following instructions to replace the four wire plug and socket.

The plug and socket configuration must be rated for at least 240VAC 30A and have a minimum of four conductors.

The power cord that attaches to the dyno has four conductors internally and their colors are brown, blue, black, and green/yellow.

1 Connect 240VAC single phase power between the brown and the blue wire connection points.
2 Connect the green/yellow wire to the ground connection point.
3 Wrap the black wire with the white tape to denote that it is a neutral connection and connect it to the neutral connection point.
4 Refer to the previous table for testing and probe the new connections as follows:
   - blue wire as location #2
   - brown wire as location #4
   - black wire as location #1
   - green/yellow wire as location #3

HARD WIRING TO THE BUILDING

Use the following instructions to wire the dyno directly to the building.

The dyno must connect to a two pole disconnect switch to allow the removal of all power to the dyno for servicing. This box may contain fusing, circuit breakers, or the circuit protection may be upstream in the building power system. The circuit must be protected to 30A with slow blow fuses or time delayed circuit breakers.

The power cord that attaches to the dyno has four conductors internally and their colors are brown, blue, black, and green/yellow.

1 Remove the dyno power plug and connect 240VAC single phase between the brown and the blue wires through the disconnect switch.
2 Connect the green/yellow wire to the ground connection.
3 Wrap the black wire with white tape to denote that it is a neutral connection and connect it to the neutral connection.
4 Refer to the previous table for testing and probe the new connections as follows:
   - blue wire as location #2
   - brown wire as location #4
   - black wire as location #1
   - green/yellow wire as location #3

CONNECTING THE DYNO

1. Turn off the main circuit breaker on the dyno. The main breaker is located in the CPI door. Off is the down position.
2. Once you verify the voltages on the receptacle, connect the dyno to the receptacle.
3. Connect the high pressure blowers to the dyno. For more information on connecting the blowers, refer to your dyno installation guide.
4. Turn on the main dyno breaker.
5. Test the blowers for operation.
6. Turn on the dyno electronics and verify operation.
7. Test the control panel operations. For more information, refer to your dyno installation guide.

LOCATIONS USING 50 HZ POWER (LOCATIONS OTHER THAN NORTH AMERICA AND JAPAN)

The next section of this appendix contains the power requirements and instructions for dyno installations excluding North America and 60 Hz areas of Japan.

> **Note:** Refer to page B-2 for power requirements and instructions for North America and Japan.

The model 200iX/250iX dynamometer (excluding North America and Japan) requires a dedicated wall receptacle which must be wired for operation and is included with the dyno or may be shipped in advanced in a separate package. The dyno is equipped with a ten foot power cord with a three-pin IEC plug pre-wired on the end. The power cord is located at the front of the dyno, but is shipped inside of the dyno. For more information on the location and routing instructions for the power cord refer to your dyno installation guide.

The model 200iX/250iX dynamometer requires a dedicated 240VAC **single phase** power outlet rated for 30A for proper operation. **Failure to follow these instructions could result in personal injury or damage to the dyno.** Connecting the dyno to the incorrect voltage will void the dyno warranty. Contact Dynojet with any questions.

The dedicated wall receptacle is a three-pin IEC grounded 30A type and must be wired in accordance with local building codes and requirements. Installation may require a licensed electrician to conform to applicable safety standards.

CAUTION

If you are installing your dyno in a location other than North America or Japan and the dyno is not equipped with a three pin IEC grounded plug, contact Dynojet before attempting to connect the dyno.

Local and national electrical codes will require that the box containing the receptacle is grounded.

- This circuit should have a dedicated 30A double pole circuit breaker.
- The dyno should be the only device connected to this circuit.
- It may be necessary to install a delayed trip breaker due to the inrush current drawn by the high pressure blowers.

INSTALLING THE WALL RECEPTACLE

The wall receptacle is a single 240 volt 30A dedicated circuit with a ground.

The cable carrying the power to this receptacle should be 4.0 mm^2 (ten gauge) or larger. Check with local building codes for the correct size.

1 Connect one of the 240V legs to the N terminal (white).
2 Connect the other 240V leg to the L terminal (no color).
3 Connect the ground conductor to the green terminal.

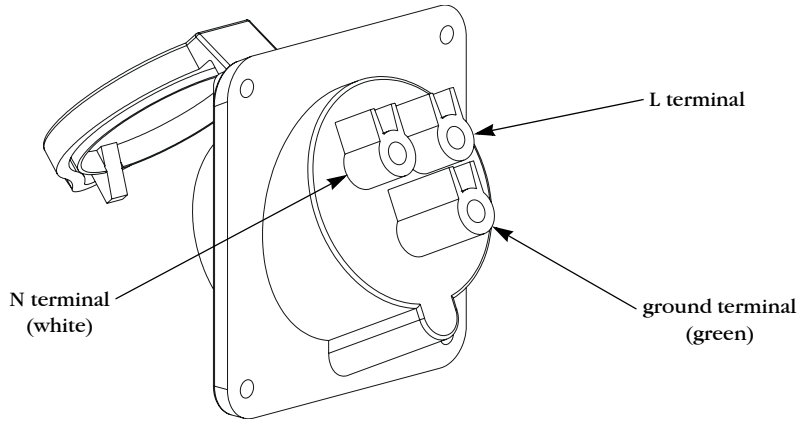


Figure B-2: Wire the Wall Receptacle

TESTING FOR CORRECT VOLTAGES

You must test the receptacle for proper voltages before the dyno is connected to the outlet.

Using a voltmeter that is capable of measuring AC voltage, measure between the points listed below and verify that the correct voltages are present.

probe 1	probe 2	desired voltage measurement
1	3	220V to 250V
2	box	<5V

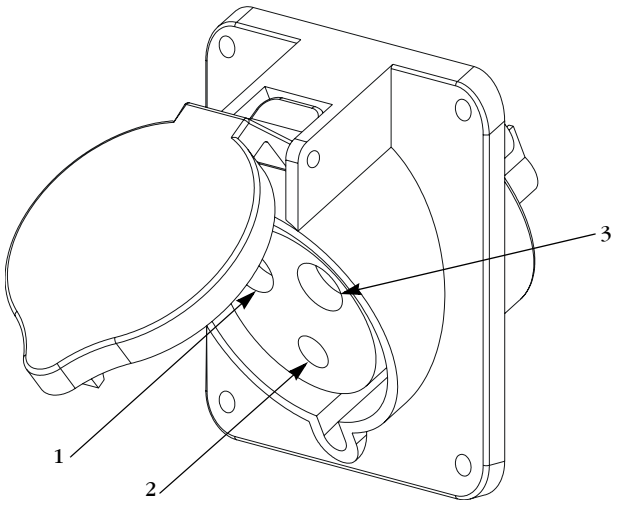


Figure B-3: Test the Wall Receptacle

Replacing the Power Plug

Use the following instructions to replace the plug and socket.

The plug and socket configuration must be rated for at least 240VAC 30A and have a minimum of three conductors.

The power cord that attaches to the dyno has four conductors internally and their colors are brown, blue, black, and green/yellow.

1 Connect 240VAC **single phase** power between the brown and the blue wire connection points.
2 Connect the green/yellow wire to the ground connection point.
3 Cut off the black wire.
4 Refer to the previous table for testing and probe the new connections as follows:
   - blue wire as location #1
   - brown wire as location #3
   - green/yellow wire as location #2

Hard Wiring to the Building

Use the following instructions to wire the dyno directly to the building.

The dyno must connect to a two-pole disconnect switch to allow the removal of all power to the dyno for servicing. This box may contain fusing, circuit breakers, or the circuit protection may be upstream in the building power system. The circuit must be protected to 30A with slow blow fuses or time-delayed circuit breakers.

The power cord that attaches to the dyno has four conductors internally and their colors are brown, blue, black, and green/yellow.

1 Remove the dyno power plug and connect 240VAC single phase between the brown and the blue wires through the disconnect switch.
2 Connect the green/yellow wire to the ground connection.
3 Cut off the black wire.
4 Refer to the previous table for testing and probe the new connections as follows:
   - blue wire as location #1
   - brown wire as location #3
   - green/yellow wire as location #2

CONNECTING THE DYNO

1. Turn off the main circuit breaker on the dyno. The main breaker is located in the CPI door. Off is the down position.
2. Once you verify the voltages on the receptacle, connect the dyno to the receptacle.
3. Connect the high pressure blowers to the dyno. For more information on connecting the blowers, refer to your dyno installation guide.
4. Turn on the main dyno breaker.
5. Test the blowers for operation.
6. Turn on the dyno electronics and verify operation.
7. Test the control panel operations. For more information, refer to your dyno installation guide.

APPENDIX

C

EEC FINGER GUARD AND DOOR SAFETY SWITCH INSTALLATION

This appendix contains instructions for installing the European Economic Community (EEC) Kit to the model 200iX/250iX motorcycle dynamometer. This appendix will walk you through installing the EEC finger guards and door safety switch. The finger guards and door safety switch are required only for European dynamometers. To ensure safety and accuracy in the procedures, perform the procedures as they are described.

For more information refer to the Air Brake and EEC Kit Installation Guide, P/N 98123114.

EEC FINGER GUARDS

The European model 200iX/250iX dynamometers require guards mounted on the front and back of the drum guard bracket. The EEC finger guards provide extra protection from the drum by regulating the distance between the drum and the chassis. The placement of the finger guards can be manually adjusted.

WARNING

Do not operate the dynamometer without the EEC finger guards properly installed. The gap between the finger guards and the drum must be less than 0.64 centimeters (0.25 inches). Refer to page C-6 for instructions on adjusting the gap.

Removing the Drum Module Hood

Before installing the EEC finger guards, the drum module hood must be removed.

WARNING

Never operate the dynamometer with the drum module hood removed.

CAUTION

Dynojet recommends using a T30 Torx driver (Snap-On PFTx30E) to remove the 1/4-inch screws. For dynos with serial numbers lower than 2030152, Dynojet recommends using a hardened 5/32-inch hex driver (such as Snap-On FA5E). A standard allen key may round off in the shallow screw head.

1 Turn off the dyno and disconnect the AC power cord from its power source, refer to "Main Dyno Power" on page 3-2.

2 Remove the eight 1/4-20 x 5/8-inch pan head screws securing the drum module hood to the dyno and set aside.

3 Remove the drum module hood and set aside.

Note: For clarity, the eddy current brake and dyno are not shown.

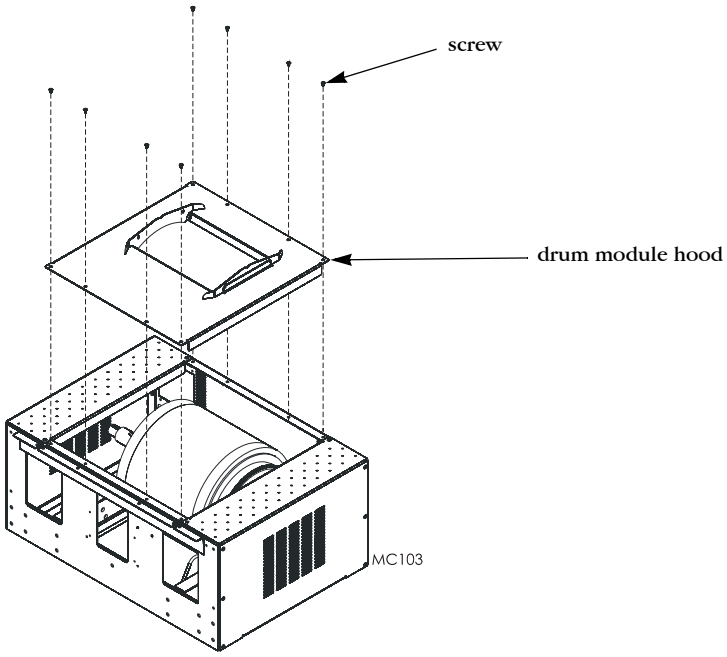


Figure C-1: Remove the Drum Module Hood

INSTALLING THE EEC FINGER GUARDS

1 Secure each EEC finger guard to the drum module hood using two 1/4-20 x 5/8-inch pan head screws.

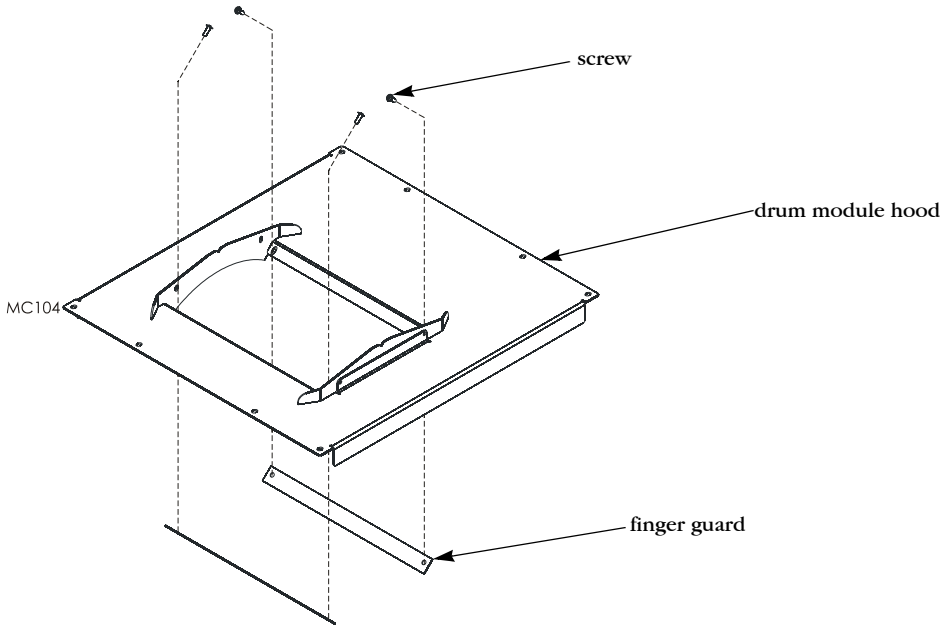


Figure C-2: Secure the EEC Finger Guards to the Drum Module Hood

2 Secure the drum module hood with the EEC finger guards to the dyno using the eight 1/4-20 x 5/8-inch pan head screws removed earlier.

Note: For clarity, the eddy current brake and dyno carriage are not shown.

WARNING

Do not operate the dynamometer without the EEC finger guards properly installed. The gap between the finger guards and the drum must be less than 0.64 centimeters. Refer to page C-6 for instructions on adjusting the gap.

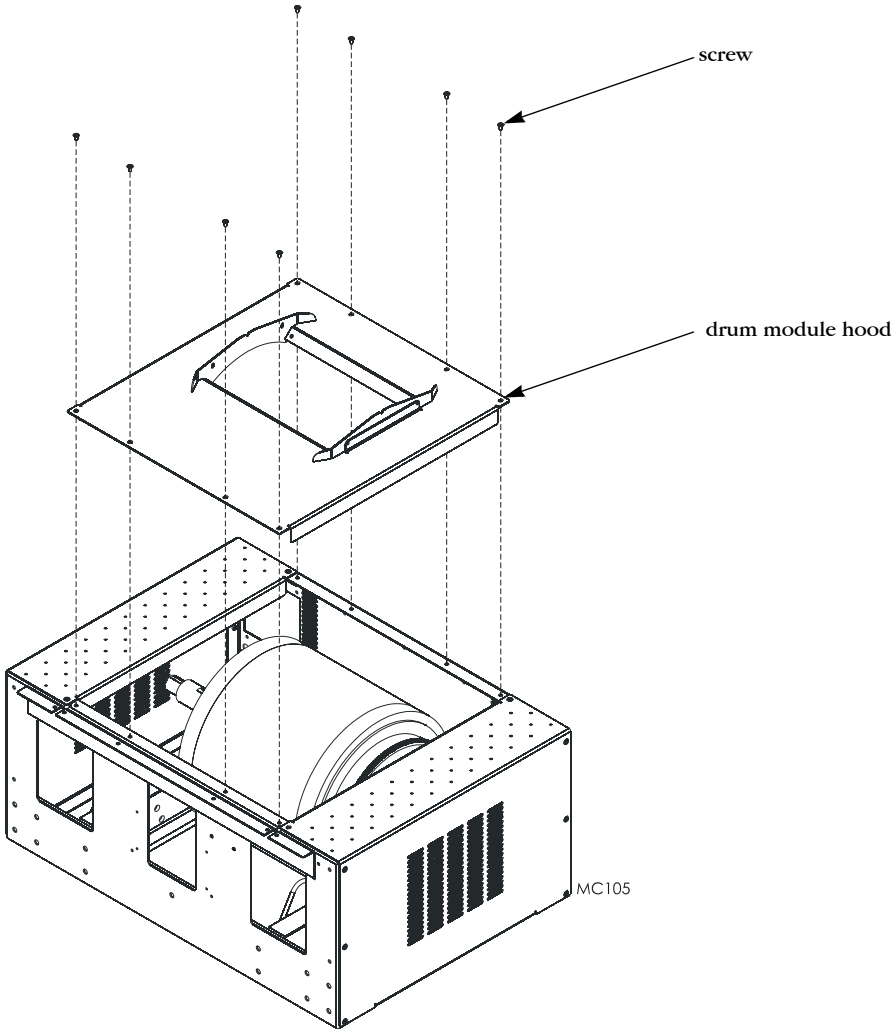


Figure C-3: Replace the Drum Module Hood

ADJUSTING THE EEC FINGER GUARDS

Once the drum module hood is installed, the EEC finger guards will need to be adjusted.

1 Loosen the 1/4-20-inch pan head screws and adjust the EEC finger guards so they are 0.16 cm to 0.64 cm (.0625 in. to .25 in.) from the drum. Tighten the screws.

2 Check the EEC finger guards regularly to verify the clearance has not changed.

Note: For clarity, the eddy current brake and dyno carriage are not shown.

WARNING

Do not operate the dynamometer without the EEC finger guards properly installed. The gap between the finger guards and the drum must be less than 0.64 centimeters.

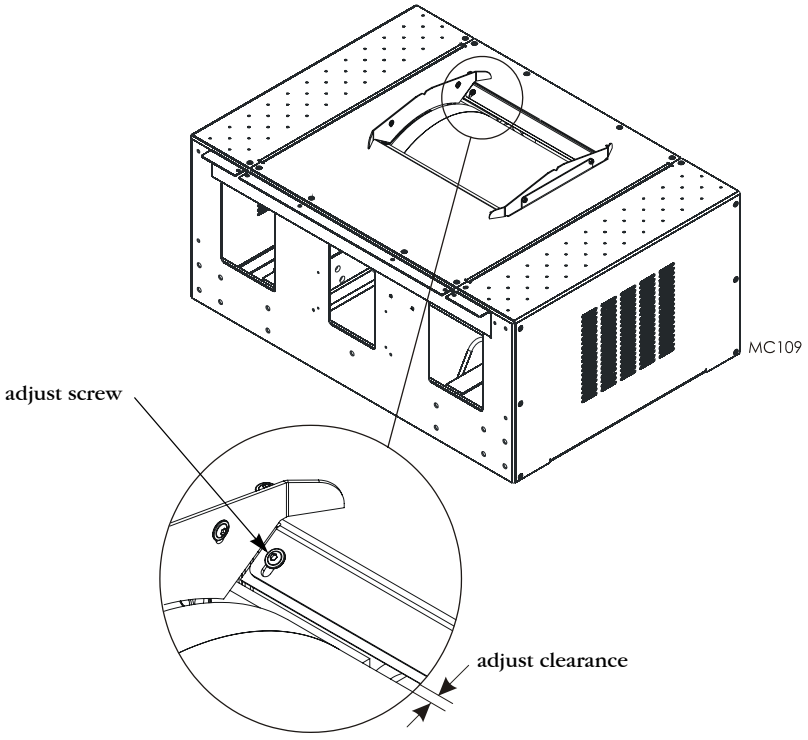


Figure C-4: Adjust the EEC Finger Guard Clearance

DOOR SAFETY SWITCH

Safety requirements of your local country may require that a door safety switch is installed. Be sure to follow the safety requirements specific to your country. The door safety switch requires the air brake to work. This switch is located on the dyno room door and is triggered when the pressure applied to it is released causing the air brake to lock. This prevents the dyno from being used when the door is open.

WARNING

Components attached to and within the dynamometer operate with potentially lethal voltages. To provide the greatest assurance of safety, the AC power cord(s) must be disconnected from the power source before servicing electrical components or wiring. Disconnect all power cords before servicing electrical components for the greatest assurance of safety.

INSTALLING THE DOOR SAFETY SWITCH

1 Turn off the main breaker inside the CPI door.
2 Unplug the dyno power cable.
3 Remove the tire carriage and center panel. Refer to Figure 3-4 on page 3-5 and Figure 3-5 on page 3-6
4 Remove the three screws securing the CPI cover and set aside.
5 Remove the CPI cover and set aside.

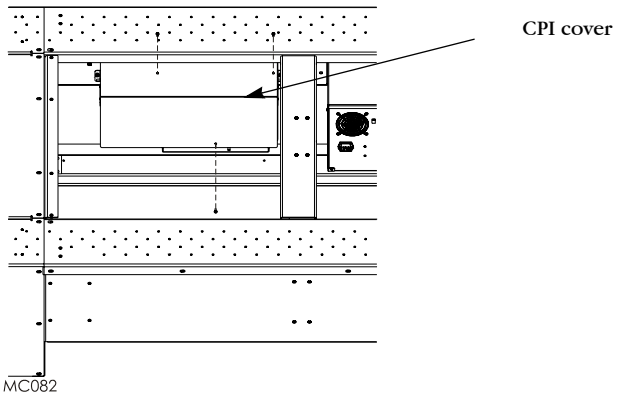


Figure C-5: Remove the CPI Cover

6 Loosen the screws that hold the jumper wires in place and remove the wire.

7 Route the black and yellow wire from the safety switch through the dyno.

Make sure the switch will not get caught in any moving components or chafed on any edges.

8 Attach the yellow wire to the 1A position on the J2 connector.

9 Attach the black wire to the 6B position on the J4 connector.

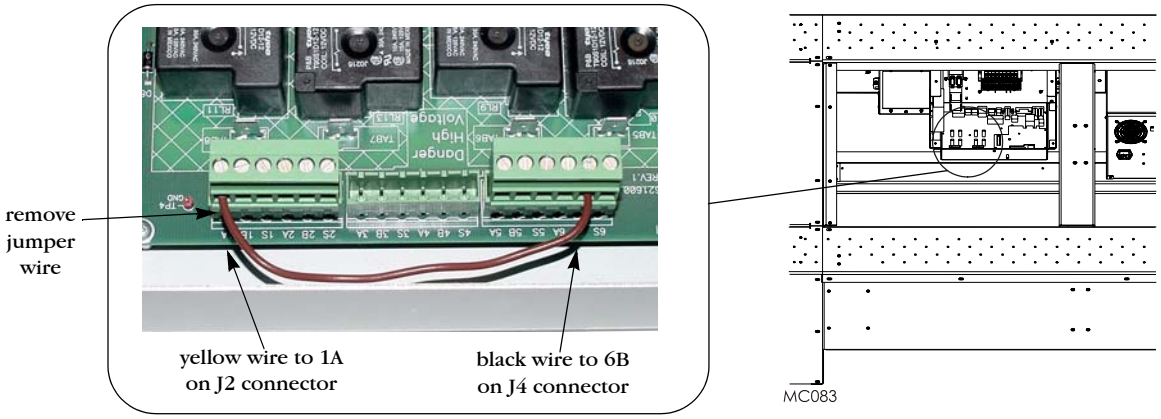


Figure C-6: Wire the Safety Switch

10 Replace the CPI cover using the screws removed earlier.

11 The door safety switch needs to be mounted at the entry of the dyno room.

12 Plug the dyno into the power outlet.

13 Turn on the main breaker inside the CPI door.

14 Open the door safety switch by allowing the plunger to extend.

The air brake should be applied holding the drum and the status light on the control panel will be flashing.

15 Depress the safety switch and the air brake will release and the status light will be on steady.

APPENDIX

D

THETA CONTROLLER

This appendix describes how to make power adjustments on the theta controller. To ensure safety and accuracy in the procedures, perform the procedures as they are described.

POWER ADJUSTMENT

The 240 VAC theta controller is calibrated for a nominal 230 to 240 VAC line voltage; in certain countries, line voltages of 210 to 220 VAC may be encountered and the dip switch can be set to provide full output current of 10 amps even with the reduced line voltage.

Note: This controller cannot be converted to operate on 120 VAC line voltage.

WARNING

Hazardous voltage. To avoid risk of electrical shock, disconnect the power cord to the theta controller. Do not remove the cover. No user serviceable parts inside.

Accessing the Dip Switches

Dynojet recommends you set the dip switches at the time of installation.

CAUTION

The two dip switches are the only adjustments that can be altered. Be sure not to damage any other parts on the circuit board. Do not attempt any other adjustments.

1 Access the dip switches through a hole in the bottom of the theta controller.
2 Use a small screwdriver to set the dip switches for the desired line voltage.

Power Line Frequency Adjustment—The theta controller is shipped with the dip switch set for 60 Hz. In some cases, the dip switch is set based on the country it is shipping to. However, you will need to determine the correct line frequency and set the switch accordingly.

60 Hz Power Line Frequency Adjustment—For all of North America, this switch should be set to the 60 Hz position. In Japan, there may be either 50 Hz or 60 Hz power line frequency; determine the correct line frequency and set the switch accordingly.

Power Line Voltage Adjustment—The theta controller is shipped with the dip switch set for normal (NORM) line voltage. In the NORM position, the controller is calibrated for a nominal 235 to 240 VAC line voltage.

In some cases in Europe or Japan, it may be necessary to set the dip switch to the LO position when the AC line voltage is consistently around or below 225 VAC and combined with reduced brake performance.

- Measure the AC line voltage with all normal AC loads running in the shop (lights, heater, etc.).
- If the line voltage is reduced to or below 225 VAC and remains at these levels, move the switch to the LO position. This will boost the output current with the lower AC power voltages.

  Note: If the AC power voltage returns above the 230 VAC range while the dip switch is set to LO, overheating and damage to the eddy current brake or fuse failure may result. Review the LO/NORM dip switch position setting and re-measure your incoming AC line voltage.

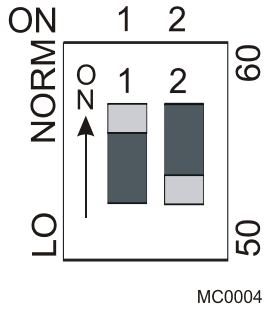


Figure D-1: Theta Controller Dip Switch Settings

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